RAILROAD GAZETTE

FRIDAY, JULY 23.

Train Accidents in June.

The following accidents are included in our record for the month of June:

COLLISIONS.

REAR.

1st, very early, passenger train on Chicago, St. Louis & Pittsburgh ran into a freight car on the main track near Windfall, Ind., and the engine and 4 cars were badly damaged, injuring 4 trainmen and a passenger. It is said that the car had been pushed out of the siding by a party of men on a drunken spree.

3d, p. m., as gravel train on Cincinnati, Indianapolis, St. Louis & Chicago was making a flying switch at a gravel pit near Waldron, Ill., the switch was not turned quick enough and the detached cars ran into the forward part of the train, wrecking 6 cars, killing 3 laborers and injuring 24 others more or less severely.

4th, a. m., freight on Denver, South Park & Pacific broke in two near Buffalo, Col., and rear section ran into forward one, damaging several cars.

5th, a. m., special passenger train on New York Central & Hudson River ran into rear of coal train near Syracuse, N. Y., damaging several cars.

5th, night, passenger train on Chicago & Atlantic ran into rear of a freight near Marion, O., damaging engine and 8 cars.

9th, p. m., freight on Pennsylvania Railroad ran into rear of switching freight at Steelton, Pa., wrecking 5 cars.

10th, night, freight on Baltimore & Ohio ran into preceding freight near Laughlin, Pa., damaging several cars.

10th, night, freight on Pennsylvania Railroad ran into preceding freight near Greensburg, Pa., wrecking 10 coke cars.

10th, night, freight on Nashville, Chattanooga & St. Louis broke in two near Harding, Tenn., and rear section ran into forward one, wrecking 5 cars and injuring a brakeman.

23d, p. m., freight on New York, Lake Erie & Western ran over a misplaced switch and into freight on a siding in Rochester, N. Y., damaging the locomotive badly.

23d, night, passenger train on Missouri Pacific ran into rear of freight at Howe, Neb., wrecking several cars.

24th, night, passenger train on Lake Shore & Michigan Southern ran into rear of freight which had stopped on the main track at Pettysville, O., and sent back no signal. Engine and several cars were damaged.

30th, p. m., yard engine on Central of New Jersey ran over misplaced switch and into passenger train at Communipaw, N. J., damaging several cars and killing a brakeman

BUTTING.

7th, night, butting collision between two freights on Pittsburgh & Lake Erie near West Economy, Pa., piled both engines and 20 cars up in a very bad wreck, injuring 3 trainmen. One of the trains is said to have been running against orders.

8th, p. m., freight on Marquette, Houghton & Ontonagon broke in two near Marquette, Mich., and rear section ran back down grade and into another freight standing on the track, wrecking engine and 35 cars.

10th, night, butting collision between two freights on Pittsburgh, Cincinnati & St. Louis near Raccoon, Pa., wrecked both engines and 20 cars, injuring the engineer. The dispatcher failed to notify west-bound train of the east-bound extra.

13th, night, butting collision between two freights on Allegheny Valley, near Oil City, Pa., damaged both engines and 8 cars. The collision is said to have been caused by the failure of an operator to signal a train to stop for orders.

18th, a. m., butting collision between freight and construction train on Old Colony, near Braintree, Mass., damaged both engines and 3 cars. The collision was caused by a misunderstanding of orders.

20th, night, butting collision between passenger and freight train on Worcester, Nashua & Rochester near East Pepperell, Mass., wrecked both engines and several cars, injuring 2 trainmen and 3 passengers. The freight expected to make the siding, but was just a few minutes too late.

26th, night, freight on Chicago, Burlington & Quincy broke in two near Creston, Ia., and rear section ran back down grade and into the head of following freight, wrecking engine and 6 cars, killing 4 laborers who were in charge of contractor's outfit and injuring 2 others.

28th, a. m., coal train on Elmira, Cortland & Northern broke in two near Ithaca, N. Y., and rear section ran back down grade and into the head of following coal train, wrecking 12 cars.

CROSSING.

5th, a. m., Western & Atlantic passenger train ran into East Tennessee, Virginia & Georgia passenger at the crossing in Dalton, Ga., damaging engine and 3 cars.

DERAILMENTS.

BROKEN RAIL.

15th, a. m., freight on Central Vermont was derailed near Centre Rutland, Vt., by broken rail.

21st, night, special passenger train on Wrightsville & Tennille was derailed near Tennille, Ga., by broken rail. Five passengers hurt.

22d, very early, freight on Pittsburgh, Ft. Wayne & Chicago was derailed near Canton, O., by broken rail, wrecking 8 cars, killing a tramp and injuring a brakeman.

BROKEN BRIDGE.

7th, a. m., as freight train on Canadian Pacific was going over an iron bridge at Petewawa, Ont., a steam shovel which was on the train struck the trussing of the bridge, and the bridge gave way, throwing 7 cars down into the river.

SPREADING OF RAILS.

1st, p. m., engine and 12 cars of coal train on Albany & Susquehanna were derailed near Afton, N. Y., by spreading of the rails.

7th, p. m., freight on Florida Railway & Navigation Co.'s road was derailed near Rosewood, Fla., by spreading of the rails.

7th, p. m., passenger train on Northeastern road was derailed on a trestlee at Santee Swamp, S. C., by spreading of the rails and the train went through the trestle and was wrecked, killing 6 passengers, injuring 5 trainmen and 9 passengers, one of the latter fatally.

7th, night, 3 cars of passenger train on Richmond & Danville were derailed near the Cowpens, S. C., by spreading of the rails.

7th, night, freight on Western & Atlantic was derailed n Atlanta, Ga., by spreading of the rails.

8th, very early, construction train on Western & Atlantic was derailed near Atlanta, Ga., by spreading of the rails.

8th, night, 6 cars of freight on Louisville & Nashville were derailed near Letohatchie, Ala., by spreading of the rails.

23d, a. m., freight on Central of Georgia was derailed in Atlanta, Ga., by spreading of the rails.

BROKEN WHEEL.

10th, very early, 4 cars of freight on New York, Lake Erie & Western were derailed near Goshen, N. Y., by broken wheel.

10th, night, freight on Union Pacific was derailed near Valparaiso, Neb., by broken wheel, injuring 2 trainmen.

17th, a. m., car of passenger train on Alabama Great Southern was derailed near Adairsville, Ga., by broken wheel.

BROKEN AXLE.

10th, a. m., freight on Indianapolis & Evansville was derailed at Saline, Ind., by broken axle and 2 trainmen were hurt.

14th, p. m., freight on Kansas City, Springfield & Memphis was derailed near West Memphis, Ark., by broken axle, wrecking 15 cars, and killing 3 tramps who were stealing a ride.

16th, night, freight on Pittsburgh & Western was derailed on a high trestle over Paint Creek, near Foxburg, Pa., by a broken axle, and 20 cars left the track, falling about 40 ft. into the creek. Four trainmen were killed and 1 badly hurt.

23d, a. m., freight on Missouri, Kansas & Texas was derailed near Denison, Tex., by breaking a truck axle under the engine. Five trainmen slightly hurt.

BROKEN TRUCK.

6th, p. m., passenger train on Richmond & Danville was derailed near Gaffney, S. C., by broken truck. Three passengers slightly hurt.

ACCIDENTAL OBSTRUCTION.

15th, night, freight on New York, New Haven & Hartford was derailed in East Bridgeport, Conn., by a rat which had been caught in a switch.

CATTLE.

6th, p. m., passenger train on Union Pacific ran over a cow near Omaha, Neb., and engine and two cars were derailed, injuring engineer and fireman slightly.

7th, p. m., freight on Wisconsin, Iowa & Nebraska ran over a cow near Des Moines, Ia., derailing engine and 2 cars.

10th, a. m., freight on Chicago & Alton ran over a cow near Slater, Mo., derailing engine and 12 cars.

MISPLACED SWITCH.

1st, very early, freight on Charleston & Savannah was derailed near Savannah, Ga., by misplaced switch.

1st, a. m., freight on Pittsburgh, Cincinnati & St. Louis was derailed at Scio, O., by a misplaced switch.

19th, night, freight on Graud Trunk was derailed near Brantford, Ont., by misplaced switch.

28th, p. m., passenger train on Boston & Lowell was derailed in Somerville, Mass., by a misplaced switch. Trainman slightly hurt.

RAIL REMOVED FOR REPAIRS.

3d, p. m., freight on Chicago, Burlington & Quincy was derailed near Avon, Ill., where some trackmen had removed a rail for repairs and neglected to put out the proper signal. The engineer and fireman were slightly hurt.

MALICIOUSLY CAUSED.

8th, very early, passenger train on Central of Georgia was derailed at Rogers, Ga., by a tie wedged down between the rails at a switch. The fireman was killed, the engineer badly hurt.

19th, a. m., engine of freight on New York, Lake Erie & Western was derailed near Hawley, Pa., by a fish-plate wedged down in a frog by some person unknown.

25th, a. m., 4 different freights on Lake Shore & Michigan Southern were derailed in Chicago by switches purposely misplaced by strikers. One of these trains was badly wrecked.

28th, a. m., freight on Lake Shore & Michigan Southern was derailed at Englewood, Ill., by a switch purposely misplaced by the strikers.

29th, a. m., 3 trains on Lake Shore & Michigan Southern were derailed in Chicago by switches purposely misplaced by strikers.

UNEXPLAINED.

4th, a. m., freight on Missouri Pacific was derailed near Leavenworth, Kan., and 15 cars wrecked.

7th, night, freight on Central Pacific was derailed near Palisade, Nev., and engine and 3 cars went down the bank and into the Humboldt River. The conductor was drowned and the engineer slightly hurt.

9th, a. m., passenger train on Ottawa, Osage & Council Grove was derailed near Osage, Kan., and a car upset, killing 2 passengers and injuring another.

9th, p. m., 6 cars of freight on West Shore were derailed in Canajoharie, N. Y., and wrecked.

10th, p. m., 3 cars of freight on Alleghany Valley were derailed in Pittsburgh, Pa., and upset.

10th, night, freight on Union Pacific was derailed near Elkhorn, Neb., wrecking 5 cars, killing 2 tramps who were stealing a ride, and injuring another.

12th, a. m., freight on Chicago, Burlington & Quincy was derailed at Riverside, Ill., wrecking three cars.

17th, night, freight on Chesapeake & Ohio was derailed just as it was going on a bridge near Ashland, Ky. The engine struck the bridge truss, knocking it down, and went down into the creek, killing 2 trainmen and injuring another.

19th, p. m., two cars of freight on Boston & Lowell were derailed near Harrisville, N. H., and wrecked.

22d, p. m., freight on Little Rock, Mississippi River & Texas was derailed in Little Rock, Ark., and 6 cars wrecked.

22d, p. m., passenger train on Wrightsville & Tennille was derailed near Tennille, Ga., and a passenger was hurt.

22d, night, passenger train on Wrightsville & Tennille was derailed on trestle at Bruton Creek, Ga., and the trestle gave way, the engine following it into the creek. Three trainmen slightly hurt.

OTHER ACCIDENTS.

BOILER EXPLOSION.

3d, a. m., engine of freight on Baltimore & Ohio exploded its boiler just as it was starting out of the yard at Bellaire, O. The engine was completely wrecked, killing the engineer, fireman and a man who was standing by the track. The fragments of the boiler almost destroyed a house near by.

BROKEN PARALLEL ROD.

25th, a. m., engine of freight on Terre Haute & Indianapolis broke a parallel rod near Martinsville, Ill, and the loose end tore a large hole in the boiler.

SUMMARY.

This is a total of 75 accidents, in which 33 persons were killed and 86 injured. As compared with June, 1885, the number of accidents was the same; there was an increase of 9 killed and a decrease of 29 injured.

The six months of the current year to the end of June show a total of 502 accidents, 190 killed and 739 hurt; a monthly average of 85 accidents, 32 killed and 123 injured.

A fuller statement of the totals and averages, with a summary of the causes of accident, will be found on another page.

The High Bridge on the Norfolk & Western.

The Farmville (Va.) *Journal* gives the following account of the new bridge which is now replacing the High Bridge on the Norfolk & Western road, near that town:

There is some very interesting and important engineering work now in progress at the celebrated High Bridge of the Norfolk & Western Railroad some five miles from Farmville, Va. When this bridge was built many years before the war, it was considered a great achievement, and even in these later days it is still to be reckoned among the larger structures on the continent, being 2,352 ft. long in 21 spans of 112 ft. each, while it is 90 ft. high at each end and 120 ft. high over the Appomattox River, the piers of brick resting on granite bases, and both brick and stone are yet in good condition, showing clearly defined sharp edges and hard mortar.

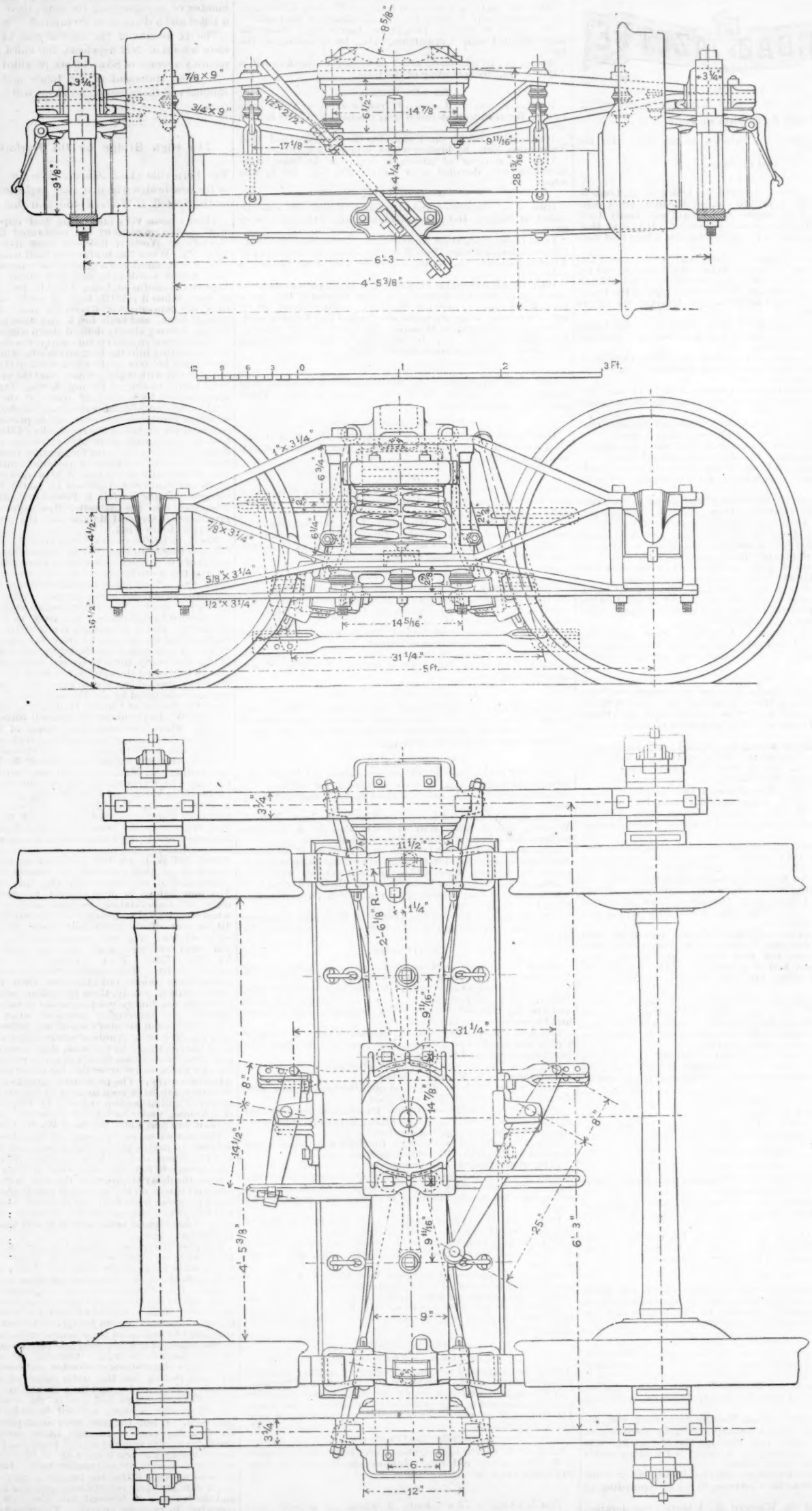
The original superstructure was a wooden Burr truss with arches footing into the bottom chords, which in turn rested on wooden bolsters on the brick work of the piers, which were not covered with coping stones; and the track was carried on cross beams resting on the top chords. During the military operations of 1865, the four spans at the west end of the bridge were burned and were shortly replaced by trestle work, in which great care was exercised to provide against the end thrust of the arches in the remainder of the bridge, as the old bottom chords were permeated by decay, and the arches were doing all the work by abutting against each other on the pier tops, yet in this condition of unstable equilibrium the structure successfully carried the light weight engines and trains of the old South Side Railroad Co. until that company was merged with the Norfolk & Petersburg and the Virginia & Tennessee, into the Atlantic, Mississippi & Ohio, under the presidency of General Mahone and the general management of Major Henry Fink.

Early in 1870 a contract was made by Smith, Latrobe & Co. (Baltimore Bridge Co.) to remove the wooden structure and replace it with a new Fink truss in wrought iron, resting on iron towers to be placed on the piers, and to uncover the piers and afford other facilities through which the railroad company should put heavy granite coping stones on top of the brick work. These operations and the condition of the old wooden bridge made it necessary to take the traffic off the bridge, and a temporary track with heavy grades was built around the bridge and over the river on trestle work. Within 3½ months from the taking off of the traffic, the new bridge was ready for it to be put back again, but some delays in regrading the approaches made it four months before the trains crossed the new bridge. The iron for this bridge was manufactured by the Phœnix Iron Co., of Philadelphia, after the designs of Charles H. Latrobe, and was erected by Charles W. Bayly under the general direction of Fred. H. Smith. There were nearly five spans of falsework timbers used and the working forces averaged about 100 men.

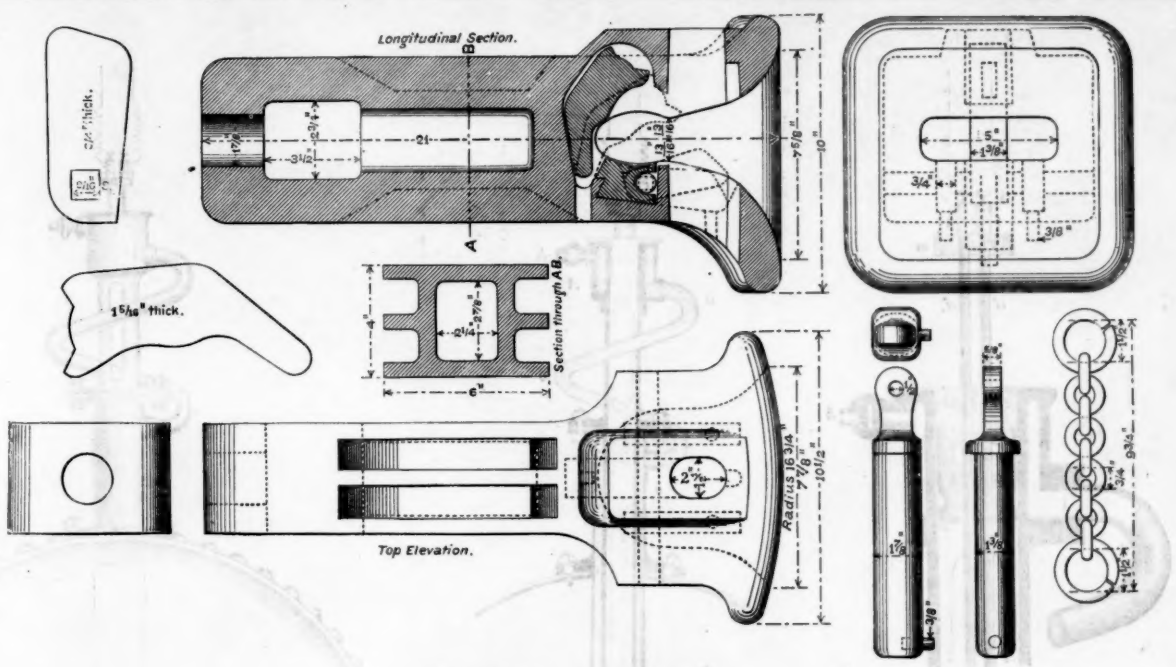
Since the development of the great coal and iron traffic from Southwest Virginia, the Norfolk & Western Railroad (succeeding A., M. & O. R. R.) has found it necessary to keep up with its competitors by heavily increasing the weight of its rolling stock, and strengthening its structures. Early in 1886 the Edge Moor Iron Co. of Delaware, and Fred. H. Smith, of Baltimore, made a contract to remove the iron Fink truss from the iron towers, and replace it with a steel and iron Pratt truss of best modern design and highest quality of workmanship and materials, the new truss to rest its inclined end posts on bed plates, shoes, etc., on the granite coping stones, thus relieving the towers of nearly all their strain and giving them only the duty of end panel posts. The new bridge is proportioned to carry a coupled up train of consolidation engines with full tenders, and when thus loaded no member is to be subjected to more than 40 per cent. of the strain that would give it a permanent set or stretch. The main tension members are composed of soft steel eye-bars made in one piece without welds, by the Edge Moor process of gas heating the ends of the bars, then upsetting these ends into paddles; then rolling these paddles until they lose their red heat so as to condense them solidly, these operations being performed by hydraulic machinery working under immense pressures, these bars are also thoroughly annealed, after their formation. The compression members are of iron plates and angles riveted together by hydraulic riveters which hold their pressure until the rivet loses its red heat, thus insuring perfect grip; and these compression members are so constructed that their interior surfaces are accessible for inspection and re-painting when necessary. The prescribed qualities in materials and workmanship have been insured by the very rigid system of shop and mill inspection enforced by Inspecting Engineer T. H. Cleeman, under orders of Principal Assistant Engineer Wentworth and Chief Engineer W. W. Coe.

The fabrication of the materials has been very seriously delayed by strikes among coal miners and rolling mill men, and the shipments have been very irregular, some cars coming through in four days and some in four weeks, and, of course, the delayed cars were the ones first needed. Enough material is now on the ground to enable the erectors to make rapid progress hereafter, and they are now in Span No. 5, and are progressing at the rate of about three days to the span, while regular train service is also being kept open over the bridge.

The plan of erection adopted is an engineering novelty, there being no trestle work used to support the bridge and trains while making the changes. There is a traveling span resting on the stone copings of the piers outside of the iron bridge. Its bottom chords and diagonals are of iron eye-bars, and its top chords and posts are of wood. Heavy cross-beams rest on these top chords and pass across underneath the top iron chords of the old bridge. The iron chords of the old span are blocked up on these beams until the lower work can be disconnected and removed and placed on truck-cars running on the railroad track; traveling derrick frames rigged with four complete sets of winches and necessary tackles run on rails resting on the outer edge of the wooded top chords of the traveler, and these tackles are used to lift out the old iron members and put in the new members under the old wooden decking without breaking the continuity of the track. When the new span is in place and is carrying the deck, the cross beams are taken out and placed across seven truck cars running on the track, and the top chords of the traveling span are hooked up to the overhanging ends of these cross beams by adjustable rods. These rods are then screwed up, thus lifting the traveling span off the piers, the truck cars are then rolled along the track to the next span, and the traveler is lowered into place on the piers by unscrewing the hooking up rods. The cross beams are removed from the trucks and replaced on the chords and the next span



FREIGHT-CAR TRUCK, LEHIGH VALLEY RAILROAD.



THE McKEEN CAR COUPLER.

is treated in the same way. The wooden deck timbers will not be changed at present, having still some life in them.

This traveling span is proportioned to carry 240 tons total load at a safety factor of 5, and of this 45 tons is the weight of the span itself with its derricks and other appurtenances. About 55 tons is the weight of the new Pratt truss and the old deck and tracks, and 140 tons is the margin for carrying the train service of a span 112 ft. in length. The transfer of this traveler from one span to another requires the track to be red-flagged about 2½ hours, and it has been done in 2 hours and 10 minutes. The broad top chords just below and outside the iron top chords are very convenient platforms for the workmen, and the bottom chords afford equal facilities for placing walk planks unimpeded by trestle posts.

There are about 40 men on the work, and most of these are what are known as tiptop bridgemen. The work of erection is under the immediate personal charge of John Kane, an expert in handling such work, and the inspecting engineer for the railroad company is Major John W. Goodwin. The general design and direction of the work is in the hands of Fred. H. Smith.

Freight-Car Truck, Lehigh Valley Railroad.

The accompanying illustrations represent a freight-car truck used on the Lehigh Valley Railroad.

It will be observed that the truck is specially braced diagonally by truss rods, in order to keep it square. The majority of freight-car trucks have practically nothing whatever to keep them from getting out of square, and where some provision is made, it will often be found either broken or so badly fitted as to be useless after a few months' running.

The Committee of the Master Car-Builders' Association on the adoption of a standard freight-car truck, have paid a great deal of attention to this matter, but have adopted a different method of framing the parts together so as to secure a square truck.*

The advantages claimed for the Lehigh Valley mode of construction are that the truck, if out of square, can be brought and held square by means of the truss rods. The Committee use channel iron transoms secured to a casting, which is in turn secured to the arch bars. It is claimed that according to that method of construction the truck must be accurately fitted and the parts machined in order to get good results. With the truss rods, it is contended that the truck can be built more cheaply and weigh less, and still be kept perfectly square. The matter was discussed by Messrs. Cloud, Goodwin, Lentz and others at the Master Car-Builders' Convention, 1885.

It must, however, be borne in mind that where a large number of trucks are regularly made to standard sizes, the machine work could be very cheaply executed, and that special milling tools and multiple drills properly designed for the work would turn out an immense quantity of trucks that would go together without any trouble, and keep in good condition for a very much longer time than the generality of trucks now running.

The McKeen Automatic Car Coupler.

The accompanying illustrations represent the latest form of this coupler, which is used on the Lehigh Valley and other roads. Some illustrations of this coupler have already appeared in these columns, but the interior construction is, however, more clearly shown in the accompanying engravings.

The coupler is of the loose-link type with pin-supporter. This pin-supporter is shown in detail on the left hand side of our engraving. In the longitudinal section of the coupler, the solid lines show the position taken when driven back by an entering link. When supporting the pin, gravity causes the supporter to fall forward and assume the position shown in the dotted lines.

The link-controller, by which the link can be elevated or depressed in order to enter the high or low drawhead of another car, is also shown in both positions in the longitudinal section, and in detail in the upper left hand corner of our illustration. It will be observed that holes are provided for the escape of any water or cinders lodging in the recesses made for the link-controller or pin-supporter.

Special provision is made to guard against injury from rough usage. Should the link strike the pin-supporter heavily, the latter is forced up the incline plane at the back, and it is claimed that the blow is thereby cushioned without the expense and risk of fracture attending the use of a spring. The link-controllers lie in a recess and are thus shielded from injury by an entering link, the common fate of most forms of link-controllers.

*The truck recommended by the Committee was fully illustrated in the *Railroad Gazette* for July 9, 1886.

Southern Railway & Steamship Association.

The annual convention of the Southern Railway & Steamship Association met pursuant to notice in Washington, July 14. Senator Joseph E. Brown occupied the chair. The following representatives were present:

Alabama Great Southern and Cincinnati, New Orleans & Texas Pacific, Frank S. Bond, President; John C. Gault, General Manager, and H. Collbran, General Freight Agent.

Central of Georgia system, W. G. Raoul, President.

Central Railroad & Banking Co., of Georgia, W. G. Raoul, President; T. D. Kline, Superintendent; W. G. Sherman, Traffic Manager, and G. A. Whitehead, General Freight Agent.

Charlotte, Columbia & Augusta and Columbia & Greenville, E. B. Thomas, General Manager; D. Cardwell, Assistant General Freight Agent.

East Tennessee, Virginia & Georgia, Henry Fink, Vice-President; Thomas Pinkney, General Eastern Agent.

Georgia Railroad, J. W. Green, General Manager; E. R. Dorsey, General Freight Agent.

Georgia Pacific, J. W. Johnston, President; I. Y. Sage, General Superintendent; G. S. Barnum, General Freight Agent.

Louisville & Nashville, M. H. Smith, President; E. B. Stallman, Vice-President; J. M. Culp, General Freight Agent.

Nashville, Chattanooga & St. Louis, J. W. Thomas, President; George R. Knox, General Freight Agent.

Norfolk & Western, C. G. Eddy, Vice-President.

Port Royal & Augusta, W. G. Raoul, President; E. T. Charlton, General Freight and Passenger Agent.

Richmond & Danville, E. B. Thomas, Vice-President and General Manager.

Seaboard & Roanoke, John M. Robinson, President; L. T. Meyer, General Superintendent.

South Carolina, A. P. Talmage, President; John B. Peck, General Manager.

South & North Alabama, M. H. Smith, President.

Western & Atlantic, Joseph E. Brown, President; P. A. Anderson, Superintendent; Joseph M. Brown, General Freight and Passenger Agent.

Wilmington, Columbia & Augusta and Wilmington & Weldon, J. H. Devine, General Superintendent.

Baltimore & Richmond Steamship Co., J. P. Foster, President; G. H. Needham, General Freight and Passenger Agent.

Clyde, New York, Steamship Line, F. G. Eger, General Freight and Passedger Agent.

Merchants & Mines Transportation Co., G. B. Aphold, President; V. D. Groner, Agent.

New York & Charleston Steamship Co., B. D. Hasell, General Manager.

Ocean Steamship Co., W. G. Raoul, President.

The first business in order was the report of General-Commissioner Virgil Powers, which was read and referred to a committee for consideration and report. Pending report of this committee, the convention adjourned until the next day.

On the second day the committee reported progress, and the convention then adjourned again until evening. At the evening session the committee reported to the convention an agreement, in which is embodied most of the suggestions of the Commissions, and which gives increased power to the officers and committees of the Association. After some discussion, the amended agreement was adopted. The convention then elected officers for the ensuing year, and decided that the next meeting shall be held in Atlanta.

EXECUTIVE COMMITTEE.

On July 16 the Executive Committee held a meeting and reappointed all the members of the Rate Committee, with the addition of Messrs. A. Pope and E. T. Charlton.

A communication was received from the American Shipping & Industrial League, consideration of which was deferred until the Committee can more fully examine the subject.

After the transaction of some other routine business the Committee adjourned.

RATE COMMITTEE.

The same afternoon the Rate Committee met. After some routine business had been disposed of a delegation was received from the Chicago & Ohio River Pool and a joint conference was held, the subject of which was an agreement by which the basis of rates and differences between points governed by that pool and points under the jurisdiction of the Southern Railway & Steamship Association may be secured. The conference was friendly and a basis of agreement was reached.

Foreign Technical Notes.

The Northern Railroad of France has found by experiment that nickel can be rolled upon soft steel plates in such a manner as to produce a material for head-light reflectors of equal brilliancy of reflection with those made of silvered copper.

These reflectors are reported also not to rust, and owing to the greater strength of the material, to be less easily knocked out of shape. The cost is only 55 per cent. of the cost of silvered copper reflectors.

Ship-building continues to be very light, as railroad building is in every country except this. The tonnage of vessels launched on the Clyde in the six months ending with June for the last four years has been :

1883.	1884	1885.	1886.
198 729	142,986	93,925	84,623

Thus this year the tonnage launched was 10 per cent. less than last year, 40 per cent. less than in 1884 and 57½ per cent. less than in 1883.

The *Zeitschrift für Bauwesen* has mention of inclined railroads recently built in Holland between the lakes Dransen and Pinnau, to take the place of a number of locks by which boats were formerly enabled to overcome the difference of level of 321 ft.

There are five planes, each having a double track laid with rails of 76 lbs. per yard and of 10 ft. 7 in. gauge, the steepest slope being 1 in 11.6 (455 ft. per mile). The cradles weigh 52 and 86 tons and are 64.6 ft. long. They are carried on eight wheels in two trucks, whose centres are 58.7 feet apart. The capacity of the cradles is said to be boats of 6 tons, which must be an error.

One cradle descends as the other rises, the two being connected by a cable passing around a drum at the head of the plane. This is run in four of the planes by vertical water-wheels, and in the fifth by a turbine. A light cable passing around a pulley at the bottom of each plane and attached to the lower ends of the cradles assures equal movement of the two cradles.

The vertical water-wheels are 27 ft. 9 in. in diameter, and have an effective width of 16 ft. 5 in. They develop 68 horse-power. The turbine works under an effective head of 25.8 ft., and has a head-race 3.28 ft. in diameter with a velocity of 140 revolutions per minute.

Mr. Edward Frank, an inspector of the Austrian State Railroads, in a study of the "Working of English Rail roads," expresses his surprise at the small number of brakes which the English managers require for freight trains. He quotes from the regulations of the London & Northwestern Railway that for a goods train with one engine, consisting of 30 loaded goods wagons or 20 loaded coal wagons, only one brake van is required, which in such case is the last car in the train, and includes the conductor's cab. With one engine and 30 to 35 goods wagons or 20 to 25 coal wagons two brake vans are required, but with trains of 35 to 45 goods wagons or 25 to 35 coal wagons and *two* engines only two brake vans are required.

Mr. Frank instances the following example :

"A train of 28 loaded coal cars on the Crewe-Liverpool Division, with a grade of 52.8 ft. per mile, has by these regu-

Fig. 4.

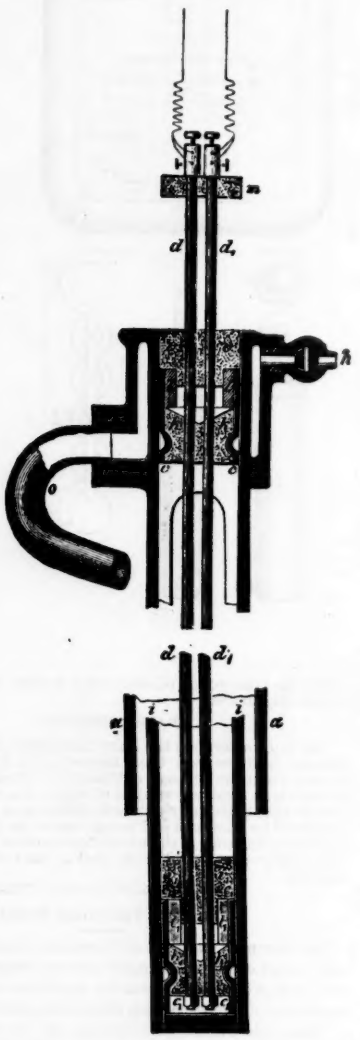


Fig. 3.

Fig. 5.

Fig. 2.

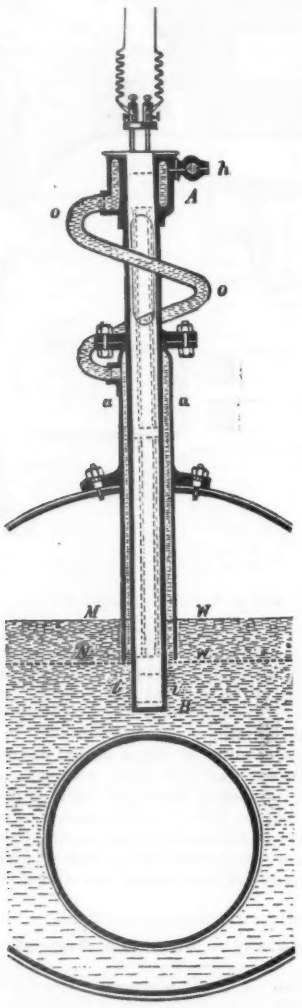
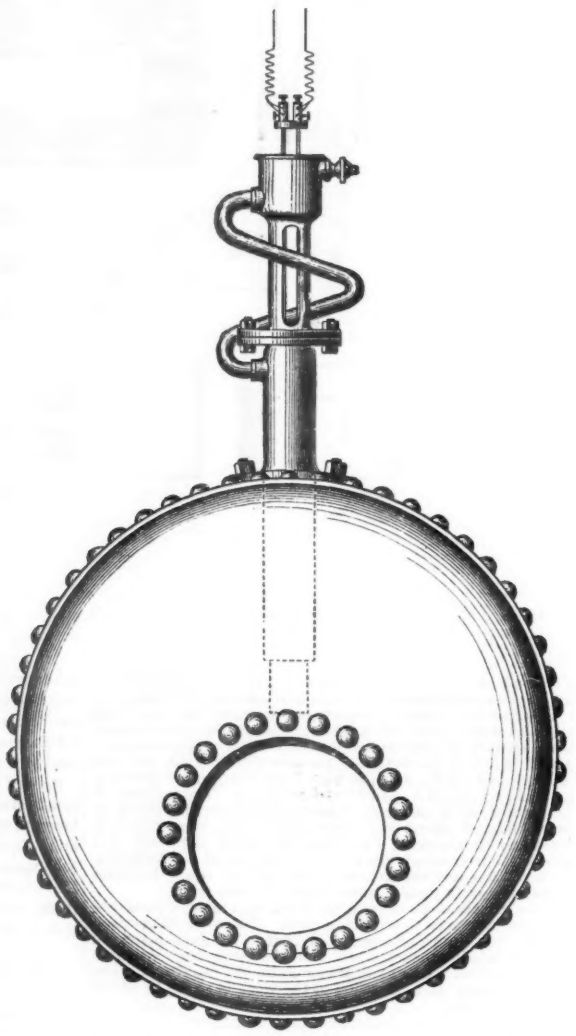


Fig. 1.



THE SCHWARTZKOPF BOILER SAFETY APPARATUS.

lar trains only two brake vans, which are generally not loaded. Thus, for 28 cars of 4½ tons dead weight and 8 tons load each—350 tons—there are two brake vans, weighing 6 tons each—12 tons with brakes out of a total of 362 tons. According to the Austrian regulations, on such a train and such a grade not less than one-seventh of the gross load, or 51 tons, must be on wheels which have brakes, while also with so heavy a load twice as many brakemen are required."

The Schwartzkopf Boiler Safety Apparatus.

The accompanying engravings show a safety apparatus which has been very largely used in Germany and has been awarded a special prize by the German Railroad Union. We are indebted to our German contemporary the *Organ of Railroad Progress* for the following particulars of this invention :

The Swartzkopf apparatus gives notice by the ringing of an electric bell, which may, of course, be placed at any desired distance from the boiler, of any of the following conditions:

1. Sinking of water below any fixed level.
2. Want of water in the boiler or firing up before steam pressure is on
3. Excess of pressure in boiler over any previously fixed tension.
4. Overheating of boiler water over the point usually necessary to produce the maximum pressure, as may occur sometimes, without producing at any given moment the maximum, from a variety of causes, such as salt or mud in the water, excessive draught of steam by the engines on the one hand, and on the other a very quiet condition of the water, which prevents steam production until it is disturbed.

A description of the action of the apparatus under the above conditions will be its best explanation.

When the water is filled to any level above *N W*, and the cock *h* (figs. 2 and 4) is opened, a very slight steam pressure suffices to drive the water of the boiler up through the annular space *a* and the pipe *o* into the annular head *A*. When this is filled so that water is discharged at *h*, the cock *h* is closed and the head *A*, with the tubes below, will remain full until the water in the boiler drops below *N W*. Now, owing to surface which the communication tube—proportioned for this purpose—exposes to the air, the water in the head *A* remains always below 212° F. as long as the boiler pressure does not go above the maximum permissible. If this is exceeded by a material amount for which the apparatus is adjusted the increased heat melts the alloy in the ring *l*, fig. 4. This ring is incased in serpentine stone in such a manner as to leave the blank space adjoining the ring on the figure open. As soon as a single liquid drop of the alloy is formed it runs down into the inverted cone and makes an electric connection between the wires *d d*, thereby ringing a bell and causing an annunciator to show in which boiler the trouble is.

It is obvious that this effect will take place still more rapidly if, owing to the water falling below *N W*, the water in *A* is discharged below and its place taken by steam.

For indicating the conditions 2 and 4, the lower end of the tube, as shown in figs. 2 and 5, comes into play. The alloy in the ring *l* (fig. 5) has a greater resistance than that in *l* (Fig. 4) being calculated to melt when the temperature of the water in the boiler is increased beyond the limit of safety. If this takes place the ring melts, and indication is given as before. If, owing to the lack of water over the flue, the tube is exposed to direct radiation from the latter, the alloy will also melt before the flue iron becomes red hot and again give warning. With apparatus calculated to allow 60 lbs. per sq. in. on the boiler, the apparatus indicates danger when the flue has reached a heat of 482° to 572° Fahr., while the heat of red-hot iron is 977°.

The alloy rings, their electrical connections, and the serpentine plugs in which the rings are inclosed form a separate and removable part of the apparatus, as shown by fig. 3, called the "chain" (kette). It is obvious that upon inspection of the chain after warning has been given the cause of it will be at once reduced to at most three possibilities; for if the upper ring is melted the cause must be low water or too great pressure, and if the lower one is melted it is due either to uncovered flues ; a bad condition of the boiler water, or excessive heating of the water, produced either by heavy use of steam, or very little use and a hot, steady fire.

Of the cause in the first event the inspector will probably have no difficulty in satisfying himself.

In the second cause a decision will be more difficult, and it will involve pretty thorough examination of all the conditions.

The apparatus is self-registering, and consequently, even if the person w. o uses it as a check is not present when warning is given, inspection of the alloy rings will show him whether the boiler has been properly handled during his absence. These rings are readily replaceable when melted without any interruption to the use of the boiler, and it is obvious that the use of it is free from the danger which may attach sometimes to the use of an ordinary safety valve—that of causing an explosion by the sudden release of the steam over the water when the latter is in an extreme state of tension.

Figs. 6 to 13 show the manner of attachment of the apparatus for different kinds of boilers, and in view of this in ordering the apparatus the following information has to be given, since the apparatus has to suit the particular circumstances of each case:

1. What is the outside diameter of the boiler ?
2. How much is low water below the top of the boiler outside ?
3. How much below low water are the highest flues ?
4. Is the boiler in masonry setting, and, if so, how high above the boiler does the masonry rise ?

The application of the above questions will be seen by inspecting figs. 6 to 13.

5. How is the boiler fired, below, inside or in front ?
6. Can the apparatus be placed in the centre of the boiler, or must it be to one side (see fig. 13), and if so how much out of centre ?
7. What is the maximum working pressure ?
8. Is the boiler roofed over, and if so how much does the roof clear it ?
9. In how many and at what places is the alarm signal to be given ? How far apart are they ? (it is necessary to state how much of the electric conductor is under cover and how much outdoors).

It is usual to put in a test circuit connecting the ends of the two "chain" wires which can be tested from time to time by a hand key.

At the end of August, 1885, there were 700 of these instruments in operation, which have given not less than 200 alarms, and these alarms include admirably conducted establishments like various workshops of the Prussian Government, the Berlin City Waterworks, the Hamburg Gasworks, Sir William Siemens' establishment in London, and so forth.

The greater part of the signals were caused by carelessness of firemen in attending to boilers, or because the proper care of the latter was delayed by attending to other duties.

In many cases, however, the firemen were deceived by false indications of water or steam gauges.

As to the indications of spring steam gauges, it is to be noted that the Offenbach Steam Boiler Inspection Co. found, in 1883, out of 734 boilers inspected, 113 gauges giving false indications, of which 97 were in error by from 3¾ lbs. to 26¼ lbs. per sq. in.

In two cases parties were warned of the running dry of boilers just in time to prevent serious accidents. In the first case, the fireman had served for 20 years with entire satisfaction.

In the other, the Master Mechanic of the Berlin-Hamburg Railway, on answering the signal, found the fireman senseless from an attack of paralysis, having apparently been some time in that condition.

In this latter case, the signal was given just as the lowest permissible water level was reached, and with the pressure 7½ lbs. above allowable pressure.

The most thorough tests have shown no failure of the apparatus from choking by rust, dust or boiler scale.

The Burlington Brake Tests.

We reproduce below a few of the details of the test stops so far made in the Burlington tests, none of which, except the distance run, are to be accepted as official, and all of which, especially the important question of speed, are liable to be corrected after the diagrams taken and other official records are compared. The all-important detail of speed, especially, is read off somewhat hastily at the moment of the stop, merely to gratify a natural curiosity, and for the same reason we give them here. The really valuable indications of the tests will come after all the diagrams and other records have been compared and collated, so as to show, not only what stops were made ; how the various parts of the machinery acted, when and in what part of the train the brakes acted most efficiently, what breakages occurred, etc.

The tests began according to programme at 8 a. m. on Tuesday, July 13, and have been continued since at an average rate of five or six runs of four stops each per day. The stops in each run are these :

Stop 1. On slight descending grade from speed of 20 miles per hour.

Stop 2. On slight descending grade from speed of 40 miles per hour.

Stop 3. On descending grade of 1 per cent. or more (54 ft. per mile) from speed of 20 miles per hour.

Stop 4. On same grade from speed of 40 miles per hour.

These stops, with the necessary intervals for getting up

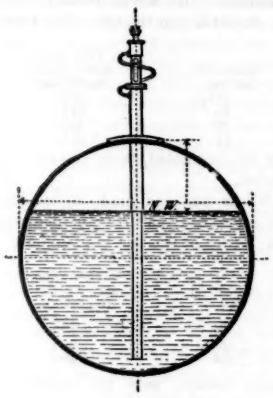


Fig 6.

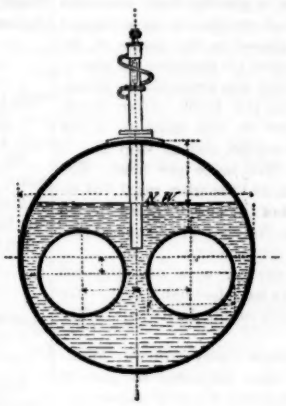


Fig. 10.

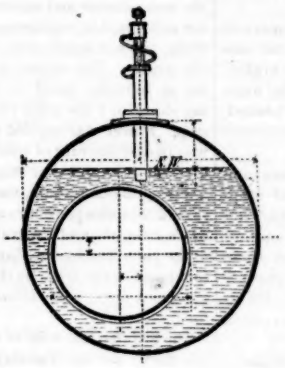


Fig. 11.

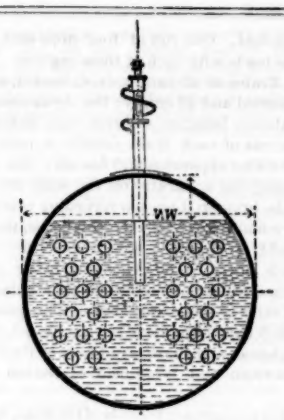


Fig. 12.

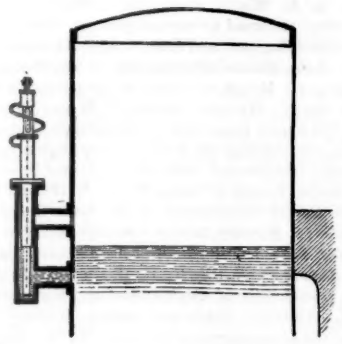


Fig 7.

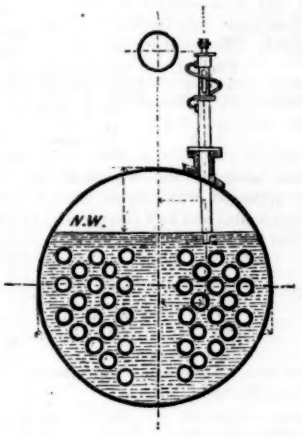


Fig. 13.

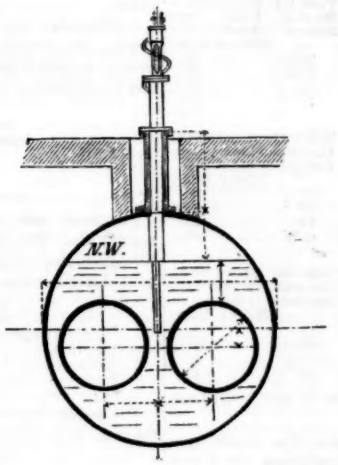


Fig. 8.

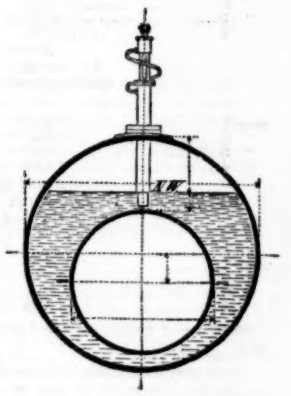


Fig. 9.

THE SCHWARTZKOPF BOILER SAFETY APPARATUS.

speed, are made on a stretch of some eight miles between Burlington and West Burlington, Ia., the Burlington shops being located in the middle of the stretch, a location which has proved very convenient for the repairs which are occasionally required. To make five runs per day over this track requires that the test trains shall run some 90 miles per day, to do which with the least possible interference with regular traffic requires very careful handling of the work and full preparation for all contingencies. Under the careful and efficient management of Mr. Godfrey W. Rhodes, Superintendent of Motive Power and Chairman of the Master Car-Builders' Committee on Brakes, and with the cordial coöperation of the other officers of the road, this end has been very successfully accomplished. But few regular trains have been delayed and those but slightly.

We shall publish a map and profile of the test track in connection with the more careful presentation of the results of the tests which we shall give later. Even if the stop records below could be relied on as correct, as they cannot be, efficiency in making quick stops is, of course, but one of several qualities required in a good train brake, although a very important one. The tests are conducted with a view of indicating the qualities of the brake in every desirable detail, and will probably do so.

Some little delay and change of programme has resulted from the fact that few of the competitors were perfectly ready at the date fixed.

The members of the committee present are:

G. W. RHODES (Chicago, Burlington & Quincy), Chairman.

GEO. HACKNEY (Atchison, Topeka & Santa Fe).

JOHN S. LENTZ (Lehigh Valley).

B. WELSH (Central Pacific).

The remaining members of the committee, Messrs. W. T. Hildrup and D. H. Neale are not present. Mr. A. M. Wellington is acting as Referee, by unanimous election of the committee and competitors.

COMPETITORS ON THE GROUND WITH TRAINS.

AMERICAN.—Provided with train of 50 entirely new and very heavy cars, averaging about 27,500 lbs. weight, though marked only 40,000 lbs. capacity. Had been run only from St. Louis to Burlington, 211 miles. The brakes were much underhung and the brake-beams of poor and brash oak. For these or other reasons, 25 brake-beams on 20 cars out of 40 came in broken as the result of the run from St. Louis to Burlington; easy grades all the way. The brake-beams on the entire train of 50 cars were accordingly renewed and a change made in the position of the brake-beams so as to get a square pull on them.

The cars are built for the St. Louis & San Francisco Railway, "Frisco Line" of fast freight, but are owned, until the completion of the endurance test, by the American Brake Company.

The American Brake Co. was represented by George H. Poor, of St. Louis, Manager; Wm. Jones, of New York, General Eastern Agent. The company has fitted Wabash, St. Louis & Pacific Engine No. 1063 with its steam-brake apparatus. The engine is run by its own engineer. Its apparatus was illustrated in the *Railroad Gazette* of Feb. 19, 1886.

EAMES VACUUM.—Provided with train of 50 new cars belonging to the Indianapolis, Decatur & Springfield Railroad, averaging 21,000 lbs. weight, and 40,000 lbs. capacity. The cast-iron draw-bars seem to be rather weak. Alone of all the competitors the brake leverage was not equalized on each axle by a dead lever, thus resulting in a "give-away" of about one-eighth of the efficiency of the brake—a very extraordinary oversight in a company entering a test of this character, but as the loss thus caused has really nothing to do with the comparative merit of the vacuum brake apparatus proper, we shall endeavor in our computations to estimate the effect of this unfortunate difference of rig.

The apparatus used is the automatic vacuum, which differs from the "straight vacuum" apparatus, as used on the New York Elevated and elsewhere, in precisely the same way, but in the reverse direction, that the Westinghouse Automatic differs from the original "straight air" Westinghouse. Instead of producing a vacuum by the ejector when the brakes are to be applied, the working of the ejector produces a vacuum in the brake-pipe which releases brakes, and at the same time produces a vacuum in the auxiliary reservoir which is retained for applying brakes, as the air pressure is retained in the Westinghouse reservoir. The maximum working vacuum is 20 to 21 in., but 15 in. is adequate for efficient work in practice. To apply the brakes, air is admitted to the brake-pipe, and at about 11½ in. of vacuum in the brake-pipe the brakes are applied. In practice, after storing the reservoirs with 18 to 20 in. of vacuum, air is admitted into the brake-pipe so as to give about 12½ in. vacuum, or within 1 in. of the point at which brakes are applied. A certain position of the brake-valve works a small ejector very slowly at about the rate at which the vacuum is maintained constant against leakage, but as it is rather a delicate matter to make this work at just the right rate, the vacuum in the brake-pipe must often be several inches below the applying point in cases of emergency stops. The extent to which this might affect the quickness of stops will be determined during the progress of the tests. The brake-shoes on the train were all new, and fitted the wheels badly, this being probably a chief reason for the improvement which appears in the successive stops.

The Eames Vacuum Brake Co. is represented on the ground by Vice-President James H. Slade, of Boston, who is manager, F. A. Casey, J. L. Folsom and N. Pettys. It has fitted Chicago, Burlington & Quincy engine No. 286 with its apparatus.

ROTE.—Provided with train of 50 new Chicago, Rock Island & Pacific cars, averaging nearly 24,000 lbs. weight, and 40,000 lbs. capacity. Practice runs before the formal tests began indicated that the car brakes did little or no work, and 30 days' time to discover and correct the defect was asked for and allowed by the Committee.

WESTINGHOUSE.—Provided with train of 50 old Chicago, Burlington & Quincy box cars, averaging a little over 24,000 lbs. weight and 40,000 lbs. capacity. The brake-shoes are worn to a good fit with the wheels. The brake-gear is "inner-hung" with trussed iron brake-beams, all of substantially the same design as that proposed as a standard by Mr. Geo. Westinghouse to the Master Car-Builders' Association. The beams with all the air-brake apparatus proper were shipped new from the air-brake works and applied to the cars at Burlington. The leverage of the brakes is greater than that used by the Chicago, Burlington & Quincy or by the other competitors, so that, although the air pressure carried in the tests has been only 65 lbs. against 70 lbs. in the daily practice of the road, there appears so far to have been rather more damage done by the Westinghouse than the other brakes in the matter of sliding wheels. This is being carefully observed before and after each series of tests, and more careful comparison of the records may disprove or reverse this difference.

WIDDIFIELD & BUTTON.—Provided with train of 50 old Lehigh Valley cars, weighing 21,000 lbs. each, 40,000 lbs. capacity. The complete train was late in arriving. Preliminary tests of the brake developed a difficulty more fully described later, which was very largely remedied by the inventor by a slight readjustment, so that in the regular tests with trains of 25 cars it showed much better, but the difficulty was still so great as to be highly objectionable. The inventor requested time, which was granted, to readjust his apparatus still further, claiming that he would be able to practically remove the difficulty. Successful passing of a repetition of the test with 25 cars was fixed on as a condition for proceeding with tests of 50 cars.

No trouble of any moment has as yet appeared in the matter of releasing brakes on the test trains. With the vacuum brake they are found to be both applied and released at the rear of trains of 50 cars in about 12 seconds. A test showed that without recharging the auxiliary reservoirs with vacuum and starting from a vacuum of 16 in. (20 in. is attainable), four successive applications of the brakes could be made on a train of 50 cars with diminishing vacuum pressures of 9¾, 6, 3 and 2 in. After the latter the brakes were applied and released still a fifth time with pressures too low to be of practical value.

Similar tests of the Westinghouse will be made with the 50 car trains. A Westinghouse train can be charged with about 50 lbs. pressure from an engine having about 100 lbs. in the main reservoir in 50 seconds, and a vacuum train with 15 in. of vacuum in about 1 minute 40 seconds, there being no reservoir on the engine.

The tests which have so far been made are the following:

FIRST. Engine runs, Westinghouse automatic, Eames automatic, American steam brake, Eames straight vacuum, Westinghouse straight air; all with engine and tender brakes, followed by a dynamometer car only without brakes. The engines used are all eight-wheel American engines, but a following pusher is used to assist in getting up the required speeds quickly, and is detached at the point for applying

brakes is reached. One run of four stops each, as above described, was made with each of these engines.

SECOND. Trains of 25 cars; mixed, loaded and empty, 12 cars being loaded and 13 empty; the dynamometer car and way car (caboose) being in addition and having no brakes. The middle car of each train carries a part of the autographic recording apparatus and has only one truck braked, the brake-applying apparatus on the other truck being used to actuate the brake-rod tension recording pencil.

Stops were made with the Westinghouse, the Eames and he Widdifield & Button brakes, three runs of four stops each to each brake. The American brake train had not arrived in time to enter these tests in its regular sequence.

THIRD. Trains of 50 empty cars. The prescribed three runs with each have been made for the Eames and in part for the Westinghouse, and the delayed tests of the 25 car trains for the American and Widdifield & Button brakes are in progress.

In detail the preliminary records of the runs, so far as made, have been as follows, *all subject to correction:*

ENGINE BRAKES.

Westinghouse.

	No. feet after applying the brake.	Time till the stop. Seconds.	Speed when brake applied. Miles p. hour.
Stop 1	426	20¾	20
" 2	1,780	43¾	40
" 3	1,133½	21	21
" 4	2,792	70	42

Eames.

	No. feet after applying brake.	Time till the stop. Seconds.	Speed when brake applied. Miles p. hour.
Stop 1	450	20¼	20
" 2	1,450	39	41½
" 3	619	28	25
" 4	1,716	46½	42

American.

	No. feet run after applying brake.	Time till the stop. Seconds.	Speed when brake applied. Miles p. hour.
Stop 1	460	18	25
" 2	1,413	35	41½
" 3	414	22¼	22
" 4	1,426	40	40

Stops 1 and 2 were on level track, Nos. 3 and 4 on about 52 ft. grade.

A test was then made with hand brakes. The engine was attached to a train of 25 cars, 13 loaded with car wheels and 12 empty, interspersed at irregular intervals in the train. It was arranged that on the level track two brakemen should go out on the engineer giving the usual signal for brakes. One brakeman going from the engine to the train, and one from the caboose to the train, but on the grade the brakemen would stand at their respective posts from the start, according to the usual method. The conductor was to set the caboose brake only. The engine would apply no power. The result of the trial was as follows:

	No. feet run after applying brake.	Time till the stop. Seconds.	Speed when signaled to apply brake Miles p. hour.
Stop 1	983	45	20
" 2	2,709	67	40
" 3	1,076	48¾	20
" 4	3,259	70	45

The next trials were to be made with a mixed train half loaded and half empty, in order to test the friction and resistance of the train in ordinary running. These were termed "gravity tests."

The 25-car mixed train was started from the upper end of the course and run up to a speed of 20 miles per hour when Post 1 was reached, thence the train was allowed to run as it would, steam being shut off, and no brakes being set until Post 3 was reached; here the speed was reduced to 5 miles per hour from the combined effects of friction and gravity, no brakes being used for this purpose. Speed was then gained until, when Post 4 was reached, a speed of 35½ miles per hour had been attained. The brakes being then applied, the train was stopped in 31½ seconds, and in a distance of 1,118 feet.

A trial was then made with a Westinghouse mixed train of 25 cars, 12 loaded and 13 empty, scattered promiscuously through the train. The results were as follows:

	No. of feet run after applying brake.	Time making stop after applying brake. Seconds.	Rate of miles per hour when brake applied.
Stop 1	398	16½	21½
" 2	1,172	30	43¾
" 3	398	17½	20½
" 4	1,490	36¼	45½

This trial concluded the first day's proceedings.

On Wednesday, July 14, the same tests were continued and gave the following result:

	Feet run after applying brakes.	Time in making stops. Seconds.	Speed of engine per hour Miles.
Stop 1	349	15½	20 on level.
" 2	1,029	27½	40 " "
" 3	361	17¼	20 on grade.
" 4	1,462	34	40 " "

SECOND TEST.

	Feet run after applying brakes.	Time in making stop. Seconds.	Speed of engine per hour. Miles.
Stop 1	330	14¼	20 on level.
" 2	979	25½	40 ¼ " "
" 3	320	14½	20 on grade.
" 4	1,506	35	44 " "

Just as the finish of the second test was accomplished, part of the gearing on the dynamometer car was broken, and the car was sent to the shop for repairs.

A hand-brake test was then made with the Widdifield & Button train. The result was as follows:

	Feet run after brakes applied.	Time in making stop. Seconds.	Speed of engine per hour.
Stop 1	1,042	47½	20 on level.
" 2	2,759	75½	40 " "
" 3	1,174	49	20 on grade.
" 4	3,493	81	40 " "

The final test for the afternoon, a gravity test, was with the same engine and equipment, except that a car arranged for autographic registering was placed in the centre of the train, but was ineffective on account of variation in size of car wheels. The record of this trial was arranged by steaming up to make speed at 20 miles per hour. After reaching stop No. 1 the train ran 12,338 ft. and came to a full stop. Power was applied by the engine, and as stop No. 2 was passed the rate of speed was five miles per hour. The brakes were applied at stop No. 4, and the train ran 1,761 ft. to a stop in one minute, the speed of the engine being at the rate of 29 miles per hour at stop No. 4. This finished the day's attempts and the train ran into the city.

The cars used by the Eames Brake Co. were not subjected to a hand brake trial, as these cars have had hand brakes for one truck only, while other cars are supplied with hand brake for both trucks.

The gravity test trial of the Lehigh Valley cars was unsatisfactory, as on Tuesday the cars subjected to gravity tests did not stop. The wind then was westerly and strong. Wednesday head winds were encountered of sufficient force to make the test not strictly fair from a scientific point of view.

On Thursday the first test was with the Eames Vacuum Brake; the engine, tender and dynamometer car (the last having no brake) made the four stops, only the driver brakes and tender brakes being applied. The result was as follows:

	No. feet after applying brakes.	Time till the stop. Seconds.	Speed when brake applied Miles p. hour.
Stop 1	335	16¾	20 on level.
" 2	1,069	32	41 " "
" 3	387	21¼	21 on grade
" 4	1,336	40	42 " "

The next tests were those assigned the Widdifield & Button Co. The first was arranged with engine, tender-dynamometer car and 24 cars loaded and half empty mixed irregularly in train. The first test resulted as follows:

	No. feet run after applying brakes.	Time till the stop. Seconds.	Speed when brake applied. Miles p hour.
Stop 1	500	22	21 on level.
" 2	1,193	49½	40 " "
" 3	588	39	20¼ on grade.
" 4	2,781	83	43 " "

The second test included 25 cars, other arrangements being the same as in the first test, and the result was:

	No. feet after applying the brake.	Time till the stop. Seconds.	Speed when brake applied. Miles p. hour.
Stop 1	636	35	24 on level.
" 2	1,697	49½	40 " "
" 3	573	27¼	20 on grade.
" 4	2,654	75	41¼ " "

The third test under same conditions as the second made the following record:

	No. of feet run after applying brake.	Time making stop after applying brake. Seconds.	Rate of miles per hour when brake applied.
Stop 1	593	32½	20 on level
" 2	1,889	32½	40½ " "
" 3	549	26	20 on grade
" 4	3,008	94½	41 " "

This completed the Widdifield & Button 25 car tests. Cars of the Lehigh Valley road were used, also engine, Chicago, Burlington & Quincy No. 286 with the Eames Brake apparatus arranged simply to apply direct pressure on driving wheels and tender.

Next followed the gravity test of the engine of the Eames Vacuum Brake. The train was run at 20 miles per hour to stop No. 1, and allowed to run to a stop, which it did in 14,975 ft. The engine then worked up steam to five miles per hour at stop 3, and at stop 4 had the brakes applied, when stop was made in 1,334 ft., the speed of train being 32½ miles per hour. The second test of the Eames Brake is tabulated below. There were 35 cars in the train. The result was as below:

	Distance run after applying brakes. Feet.	Time from applying brake to stop. Seconds.	Speed of train when brakes applied. Miles.
Stop No. 1	426	22½	20 on level.
" " 2	1,399	44	38½ "
" " 3	588	29	21 on grade
" " 4	2,811	75	40¾ "

Mr. Slade, of the Eames Co., considers this last a courtesy test, as the engine had not been perfectly refitted to the working of the automatic vacuum brake, after being used with the Widdifield & Button cars.

The first test made on Friday morning was the Eames Brake test with a mixed train of 25 cars, 13 loaded and 12 empty, the dynamometer car without brake, the automatic registering car with brake on one truck and the caboose car attached, the cars being placed after the engine—in the centre of the train—and at the end of the train. The record of the result is as follows:

	Speed in miles.	Feet run after applying brake.	Time after applying brake to stop. Seconds.	Time of release after stop. Seconds.
Stop 1	21	473	23	20
" 2	38½	1,344	42	13¼
" 3	20	485	25¼	20¼
" 4	41¾	2,032	57½	24¾

The release is the time from the stop until the brakes are fully released.

Test No. 2 exhibited figures as follows:

	Speed in miles.	Feet run after applying brake.	Time after applying brake to stop. Seconds.	Time of release after stop. Seconds.
Stop 1	22	443	21¾	19¼
" 2	40	1,477	43¾	19
" 3	20½	511	27	22
" 4	42½	2,465	66¾	22¼

The third test was with Chicago, Burlington & Quincy engine No. 119, arranged with Westinghouse brake and the dynamometer car without brake. The other engines had been subjected to a straight air pressure as distinguished from the automatic, and it was deemed fair that the Westinghouse Co. should accept the test. The result was:

	Speed in miles.	Feet run after applying brake.	Time after applying brake to stop. Seconds.
Stop 1	21½	363	16½
" 2	40	941	27½
" 3	22	425	21½
" 4	41	1,331	36½

The release was not noted, as no caboose car was along to make the record.

The first 50-car test was made by the Eames Co. One car had to be removed from the train on account of bad work upon it. The record of this test is as follows:

	Speed in Miles.	Feet run after applying brake.	Time after applying brake to stop. Seconds
Stop No. 1	20½	441	19¾
" " 2	37	1,120	33
" " 3	22½	524	25
" " 4	39	1,486	34½

Among those present were the following: Mr. J. W. Cloud, Engineer of Tests of the Pennsylvania Company; Mr. R. H. Wilbur, Asssistant Superintendent of the Lehigh Valley, and Mr. R. P. Linderman, also of the Lehigh Valley; Messrs. H. M. Waring and Charles Buschow, of Lincoln, Nebraska, Railroad Commissioners of Nebraska; Geo. C. Smith, Chief Engineer and J. B. Maxon, of Ottumwa, Superintendent of the Middle Division, both of the Chicago, Burlington & Quincy; Mr. S. S. Fuller, of Stratford, Ont.; J. Saxtel, Lake Erie & Western; Messrs. C. H. and Henry Schlacks, of the Machinery Department of the Illinois Central; G. R. Henderson, representing the Motive Power Department of the Pennsylvania; Ben Johnson, of the Motive Power Department of the Atchison, Topeka & Santa Fe; J. W. O'Connell, Chicago, Motive Power Department of the Lake Shore & Michigan Southern; S. Porcher, Motive Power Department of the Pennsylvania; R. W. Bushnell, Master Mechanic Burlington, Cedar Rapids & Northern; R. W. Bayley; A. N. Monter, Master Car-Builder of the Kansas City, Fort Scott & Gulf; H. K. Whitner, Automatic Safety Brake Co.; L. S. Coffin, Railroad Commissioner of Iowa; W. W. Hanscom, of San Francisco Straight Air Automatic Brake Co.; E. W. Ellis, W. T. Van Dorn and John Fitzgerald, of Lincoln, Nebraska.

A special dispatch from Burlington, dated on the evening of July 21, says: "The results of the last four days' tests of 50 empty car trains are highly instructive and important. The Westinghouse, the Eames and the American were the only competitors. It seems plain that emergency stops will all cause violent shocks, approaching the shock of a collision in the rear third of the train, in the middle much less violent in front not felt at all. The violence increases faster than the square of number of cars. Both air brakes cause only one shock, the buffer brake causes from four to ten, mostly of less violence.

"The American brake showed finely on 25-car tests, giving quick and smooth stops, but admits that 50-car stops are impracticably violent, and this brake practically withdrew today from the 50-car runs with brakes on every car. It is now probable that tests of 50 cars with brakes on the front 30 only will be made for all five competitors.

"The motion at the rear end indicates that it would be probably much better to graduate the air-brakes, so as to insure moderate motion in the 50th car. Working stops with appliances to measure violence will be tested hereafter. There has been considerable breakage after all emergency stops, and these stops will be necessarily abandoned, as all the cars would be soon unfit for service."

Contributions.

The Classification of Domestics.

NEW YORK, July 21, 1886.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In your issue of the 16th appears an editorial upon the classification of cotton goods which does not meet the case fully. Let me give you, very briefly, a few points. The merchants ask for a lower classification on staple domestic dry goods for the following reasons:

First. They are staples. It has been said that cotton piece goods are the flour and sugar of the dry goods trade. The trunk lines in other articles recognize this distinction. Fine chinaware is first class, crockery is fourth; shelf hardware is one class, staple hardware is another. Instances could be multiplied. Some schedules of the railroads already recognize this distinction. The Transcontinental Association classify every article of dry goods separately, silks being first class and cotton piece goods fifth class. This is under the well-established rule that the necessaries of life should be carried at lower rates than the luxuries, whether there be direct competition or not.

Second. The traffic will not now bear first-class. The prices of domestics in Chicago and St. Louis are substantially the same as in New York. This is partly owing to the competition of the Southern and Western mills. The price on the raw cotton from Augusta, Ga., to New England is 74 cents per 100 lbs., from Atlanta, Rome and Dalton, Ga., it is 85 cents per 100. The average loss in weight during the process of manufacture is 12⅛ per cent., giving 65 cents freight for the product to Chicago, a total of $1.50 for transportation. The Southern roads classify domestics first-class when moving southward and sixth class when northward bound. This is 59 cents from Atlanta or Augusta to Chicago, the distance being the same as from New York to Chicago. Allowing a few cents for freight on tare the differerence is substantially $1 per 100 lbs., or ⅛ of a cent per yard. When we remember that ⅛ of a cent may compel the closing of an

Eastern mill, we can see what the result of this state of things would be in time when the Southern and Western mills approach New England in cheapness of manufacture. It is a well-known law that the price of the cheapest mill governs; cheapest, that is, in transportation as well as manufacture. The New England mills, therefore, although turning out the larger percentage of product, must conform to the prices in the Western markets set by the near-by mills. Another effect is that the Western jobber "stocks up" during the season of water carriage and can thus undersell his Eastern brother. Both these causes have made it impossible to sell in the West at Eastern prices plus the schedule freight charges.

There are other points, such as the attitude of the Southern Railway and Steamship Association upon the question, which are important to a thorough understanding of the matter, but space forbids. You remark that the question is whether the cotton shipments from New England have fallen off. This is not decisive. Too much capital is invested in the plant in New England to accept the first rebuff. It was cheaper for the Eastern mills to manufacture without profit rather than lie idle; but the result of this condition of things, if continued, will certainly be the stoppage of the New England mills engaged in the manufacture of coarse cotton goods. T. L. GREENE.

[Because an article is a "staple," which means, we suppose, that a great deal of it is consumed, is not a reason for putting it either in a high or low class, though a great many "staples" have to be carried at low rates in many parts of the world. The rule is not well established that the necessaries of life should be carried at lower rates than the luxuries. "Luxuries" might not be consumed at all if the rates were high, and then it would be for the advantage of everybody—producer, consumer and carrier—that the rate should be low, so long as it left any profit whatever.

If the traffic will not bear first-class rates—if the price for transportation added to the price of the goods where shipped, and the other expenses is greater than the price the goods will bring at destination, that is an all-sufficient reason, and the only one that could be urged; but in all the arguments urged when the matter was presented two years ago, there was no attempt made, so far as published reports show, to prove this; such a state of things could only be caused by the competition of other sources of supply; for the transportation at present rates does not add enough to the cost to the consumer to affect the consumption. But however caused, if the Eastern manufacturer cannot sell goods in the West without loss when the cost of transportation is as great as it is now, then the railroads which carry from the East to the West must either reduce their rates or lose the business and the whole profit on it. Just as soon as it is shown that this is true, they will be just as anxious as any one can be to reduce their rates, provided some margin of profit is left, for their own benefit. They want to make money, and they can't make money without carrying goods. But such a fact is not established by complaints, but by facts—statistics of shipments from different markets, etc., or any other definite facts showing that the transportation is not worth what it costs.

It is not always the case that a railroad can reduce its rates to enable one manufacturer to meet the competition of another. A railroad from New York to Chicago, for instance, would find it a difficult matter to reduce the rate from New York to Chicago to enable an old New York manufacturer to meet the competition of a new Buffalo or Pittsburgh manufacturer. It is perfectly legitimate, however, for the railroads from the East to the West to meet the competition of the railroads from the South to the West. They have been doing it in the case of pig iron until the new Southern furnaces get the railroads to carry their product to the Northwest for the bare cost of doing the work, while the railroads from the Pennsylvania and Ohio furnaces do about the same. This may be sport to the manufacturers, but it is death to the railroads, and they naturally try to avoid extending the same condition of things over other branches of traffic. A constant struggle is necessary to prevent it, and after all it cannot always be prevented. Should mills multiply in the West, nearer the cotton and nearer the consumer of the goods than the Eastern mills, it will become harder and harder for the Eastern mills to supply the Western market, and the end very likely will be that after reducing rates to bare cost the business will be lost both to the Eastern manufacturers and the Eastern railroads. It seems that now there are too many mills for the demand, and that if the Eastern mills recover what they claim to have lost to the Southern and Western mills, the latter must suffer. These, too, have a right to live—if they can—and will not see their present customers taken from them without a struggle, in which they will call upon the railroads which serve them to help them.

Classification is governed, or at least is limited, not by the value of the goods, but by the *value of the transportation*. Prices below the average are accepted by carriers because they can't get any more, and they can't get any more because the service is not worth any more to the man who pays for it. If this were always borne in mind it would save a great deal of inconsequent discussion when such subjects come up. It sometimes occurs that goods which cost very little per pound bear a high classification, because by the transportation a large addition to the price can be obtained. On the contrary, articles which are valuable in proportion to weight sometimes will not bear a high classification, as is the case with coffee now between the seaboard and the West. It seems strange that it should be so, but experience shows that the coffee goes by canal and lake unless the rail rate is very low, and an article which would bear the highest rate, so far as the consumption is concerned, and is worth 12 to 20 cents a pound, gets carried for about the same rate as corn, worth less than a cent a pound. For the value of the transportation by which rates are limited is not the "value in use," but the "value in exchange"—not what the consumer would pay for getting it carried rather than go without it, but what he will pay for getting it carried by this railroad rather than by other means.—EDITOR RAILROAD GAZETTE.]

THE SCRAP HEAP.

Strikes from a Mexican Point of View.

The *Mexican Financier* of July 10 says: "The attention of the press of the United States is respectfully called to the fact that the recent troubles on the Lake Shore & Michigan Southern Railway, had they occurred in Mexico, would have been deemed worthy of the name of 'revolution.' Let either the Central or National railroads fall into the hands of such desperate mobs of striking workmen as wrecked engines, attempted the destruction of an express train, and used deadly weapons at Chicago, and with one voice the press of the United States would proclaim the breaking out of a regular revolution here. Were it possible for similar scenes to be enacted here, passenger travel from the United States would cease; American merchants trading in this country would refuse to send goods forward, and even mail communication would be interrupted. From recent occurrences it would seem that the storm centre of revolutionary disturbances has shifted toward the North. Mexico continues quiet; her great cities are peaceful and business goes on without disturbance. It is only when we cast our eyes over the northern border that we expect to see evidences of rioting and lawless assumption of control over property. There is food for reflection in all this for the newspapers of the great American cities."

Railroad Accident in Ireland.

A serious accident occurred recently near Portadown, on the Great Northern Railway of Ireland, by which 5 persons were killed and 20 severely injured. The accident occurred about two miles below Portadown, at a spot where the line runs alongside a deep ditch. It is believed that the great heat of the previous two days had caused the rails to expand, and on the 2.30 p. m. train from Portadown to Dublin reaching the place, the engine left the track and dashed into the ditch, dragging with it the whole train save the guard's van, which, from some unexplained cause became detached, its occupants escaping unhurt. The engine-driver and stoker were pitched headlong into a meadow on the other side of the ditch, and were also uninjured. The two carriages next the engine were telescoped and completely wrecked, and of the passengers 4 were killed and the rest injured.

Prompt Punishment of a Defaulter.

The American Surety Co., of New York, issued a bond to the Continental Oil Co., of Denver, Col., upon Wait E. Davis, agent of the oil company at Las Vegas, N. M. Recently Davis closed up his accounts, showing a deficit of $499.60, and sent them to the company with the statement that he had lost his pocketbook which contained the money. He also left Las Vegas for Denver to get out of the jurisdiction of New Mexico. The Continental Oil Co. reported the situation to the American Surety Co., which forthwith despatched an inspector to Colorado to investigate the case. By a carefully arranged plan the presence of Davis was obtained in Las Vegas, and inquiries having elicited information showing conclusively that his story of the loss was false he was immediately arrested, and on a preliminary examination, which was sharply contested, he was committed to jail in default of bail to await the action of the Grand Jury. His conviction is regarded as certain.

The American Surety Co. promptly paid the Continental Oil Co. the amount of the loss, which was duly acknowledged.

Electric.

Railroad companies believe in the use of the blue envelope as a non-conductor.—*Rochester Union.*

Whistling too Much.

Passengers have been complaining that engineers of Erie freight trains have formed the bad habit of blowing the whistles unnecessarily when passing passenger trains. The result is an order forbidding all whistling when passing such trains except when it is necessary for safety. The order has just taken effect.

A Discharged Employee Saves a Train.

A Pittsburgh dispatch of July 16 says: "The passengers on the Baltimore & Ohio express train, due here at 7 a. m. yesterday, had a narrow escape from disaster. A freshet had swept away nearly all the trestle work over Jenningson's run, near Cumberland. As the train approached the engineer saw a light waved ahead, and by reversing the engine he stopped the train just in time to avoid an accident. The man who had discovered the danger and given the warning had recently been discharged from the service of the railroad company. He will be suitably rewarded."

An Outside Opinion on the Discharge of Conductors.

The Owego (N. Y.), *Times* says: "Certain conductors on the Erie Railroad have been lately summarily discharged. It is reported that a certain high official has said that conductors should not be retained over five years. Another official, a step lower in authority, said that a conductor over three years on the road became too well acquainted with the traveling public. So far as we can learn these conductors removed have not had any charges preferred against them, and yet their summary removal casts an imputation, shadowy it may be, yet an imputation, on their integrity which does them great injury, and, in our opinion, positive injustice. The Erie has long had the reputation of having gentlemanly conductors, men who sustained unblemished reputations, reflecting credit on the great thoroughfare they, to some extent, represent. If officials are to be cast off in this way, regardless of long and faithful services, their successors may naturally conclude that efficiency and devotion to the interests of their employers, the Erie Co., do not count, and that they may as well 'make hay while the sun shines.' It is a dangerous feeling to become prevalent. The history of the Erie proves that such a reckless spirit has prevailed in times past, among those high in authority, with disastrous results. It will be an evil day for the prosperity of the road if the management so acts that such a spirit shall pervade that class of officials who come in direct contact with the traveling public. One of the conductors summarily removed has been through three strikes, never failing in his devotion to the company, though often at the risk of his life. He has been detailed for the most difficult and dangerous duties, and never failed to respond promptly to all demands on his time, influence and strength; and yet his removal is made as summarily as if charges had been made and sustained against him. Some others removed are known to be honorable men, worthy of better treatment. We do not knowingly sustain any man insubordinate, insolent, dishonest or incapable."

Train Wreckers Arrested.

A St. Louis dispatch says that detectives employed by the Missouri Pacific Co. have succeeded in finding the parties who removed the fastenings from two rails on that road near Wyandotte, Kan., on April 26 last, causing the wreck of a freight train and the death of two trainmen. Four men have been arrested—George Hamilton, Michael Leary, Wm. Leary and O. J. Lloyd—and will be tried for the crime of murder.

An Appropriate Text.

Rev. J. E. Price, of the Adams Avenue M. E. Church, preached a sermon last evening to the Brotherhood of Locomotive Engineers. His text was from the fourth verse of the second chapter of the Prophet Nahum:

"The chariots shall rage in the streets. They shall jostle one against another in the broad ways. They shall seem like torches. They shall run like the lightnings."

There was a large number of railroad men present and the sermon was well received. The reverend speaker dwelt upon the heroism, the obedience and the charity of the average engineer.—*Scranton (Pa.) Truth, July* 19.

Boys Save a Train.

A dispatch from New Haven, Conn., July 20, says: "Christie Holston and Willie Kehoe, two 12-year-old boys, started out of this city early this morning to trap birds. Just across West River they took to the track of the New Haven & Derby Railroad and walked along the line. Just as they reached the Allington cut they saw a big bowlder weighing several tons loosen itself from the top of the bank and roll down upon the track. At the same time the boys heard the whistle of a passenger train which was approaching the cut. The youngsters' wit didn't desert them. Pulling out a red handkerchief Holston tied it to a stick he was carrying and ran toward the train waving his flag of warning over his head. Close upon his heels came Kehoe making desperate efforts to pull off his red shirt for use in warning the engineer. The boys had no time to spare, but they ran around the curve and the engineer saw them just in time, bringing his train to a standstill not far from the big rock, which blocked the track completely. It took the train hands over half an hour to clear the line. Meanwhile the passengers descended from the cars, and after they had seen what an escape they had had, one of them took up a collection for the boys, who found themselves $10 richer for their quickness. On the train were ex-Gov. Andrews, High Sheriff Gates, and other well-known citizens."

Information.

"What is that big iron thing full of holes?" asked Laura. "Locomotive boiler," said Tom. Laura looked thoughtful. After a moment's hesitation she asked: "Why do they boil locomotives?" Tom looked amazed. "To make 'em tender," he said slowly.—*Burdette, in Brooklyn Eagle.*

An Insane Man at the Throttle.

Thursday afternoon, when Engineer Riordan, of the Chicago, Milwaukee & St. Paul Railroad, was cleaning Engine No. 236 in the Northwestern yards, at the corner of Kinzie street and Western avenue, a man about 30 years of age jumped into the locomotive before Riordan could prevent him. The stranger pulled the throttle valve and the engine started off at a lively rate. The fireman was standing in front of the engine at the time, and was almost run down. Riordan, at the risk of his life, jumped on his engine, and was compelled to throw the man off the moving locomotive before he would release the valve. Riordan immediately reversed the lever, and was just in time to prevent the huge iron horse from crashing into an engine in front of him, where four men were repairing it. The workmen were under the engine at the time, and had the engine not been stopped just when it was several lives would undoubtedly have been lost. The man who started the engine was subsequently arrested.—*Chicago Herald, July* 17.

He Thought He Could Jump.

The Montreal express train, which leaves this city at 8.15 p.m., does not stop at Chicopee Junction, but rattles past at the rate of 25 miles an hour. Saturday night John Corbett, 21, of this city, who wanted to stop over, jumped from the train and landed on the opposite track, with his head wedged between two sleepers. Nobody saw the foolhardy act; but the station baggage-master, while going his rounds a few moments later, discovered Corbett in an insensible condition, with his nose split, his shoulder dislocated, one finger broken and his body badly bruised in several places. Officer Flynn brought him to the station-house in this city Saturday night, and he was taken to the city hospital yesterday. He will recover.—*Springfield Republican, July* 19.

Old but Spry.

On an incoming train yesterday among the passengers was a very old lady who had apparently come a long distance and alone. Her appearance excited the sympathy of those on board, and the conductor also tried to be obliging. In one of his trips he stopped by her seat and said: "Are you not almost too old to be traveling alone?" "Oh, I guess not," was the reply. "Well, now, how old are you?" asked the collector of fares. The old lady looked him over a second or two, and answered with a cunning smile, "I am just six years younger than the old man." The conductor came to the conclusion that the ancient matron was able to look out for herself, and offered no more attentions.—*Buffalo Courier.*

An Old Engine.

The stationary engine of the rolling mill at the Reading Iron Works in Reading, Pa., has just been taken out, after working steadily for close upon 50 years. This engine was built in Pittsburgh and was hauled by wagon the greater part of the distance thence to Reading. It is still in good order and is now removed to make way for a larger engine.

RAILROAD GAZETTE

Published Every Friday.

EDITORIAL ANNOUNCEMENTS.

Passes.—*All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.*

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

THE BURLINGTON BRAKE TESTS.

The brief report in another column gives a general idea of the "face of the returns" so far secured in what is unquestionably the most thorough and careful attempt to settle a complicated mechanical problem which has ever been made in this country. The question what freight train brake shall be adopted is, perhaps, not so complicated or difficult a one, in one sense, as that of automatic couplers, for it admits of more ready and definite experimental test, and the number of possible competitors is far less; but it is certainly one which requires far more extended and expensive preparation to investigate experimentally than any test of couplers, and the preparations for the tests now in progress at Burlington are as complete as could be desired.

The bald reports which we present this week are not to be taken as in any way decisive, as we have endeavored to caution readers in giving them, nor even as correct in detail. The distance run in each test is presumably correct, but the speed is a mere hasty reading from one of the various diagrams taken to satisfy immediate curiosity, and may easily be in error materially in some of the records. The very completeness of the preparations which have been made to insure that every material fact shall be observed and recorded make it difficult to present properly the facts until there has been time for comparing the official records and diagrams and properly presenting them; and it would be unfair and improper to draw any definite conclusions, even as to comparative efficiency in making quick stops (which is only one of several qualities undergoing investigation) from anything which has as yet become public. Much of the material for more definite judgment is already in our possession, but to present it properly, and to insure that all possible sources of error and perhaps injustice are eliminated, time and a fuller body of records are needed. Therefore, while we expect to present all the interesting results of these tests with great completeness eventually, we shall not now attempt to comment with any detail on the results so far attained.

Five competitors are on the ground with trains of 50 cars each; the Westinghouse automatic, the Eames automatic vacuum, the American (direct buffer and steam-driver brake), the Rote (direct buffer) and the Widdifield & Button (friction buffer). The first three named have each an engine fitted with its apparatus and run by its own engineer. The last two have relied upon the others for the necessary engine brake. The American train had only arrived on Monday of this week, it having had the misfortune to have its nearly completed train burned up a short time before the trial, as was noted in our columns at the time. The Widdifield & Button train has likewise only been made up to its full complement as we go to press.

With the three complete trains and the fraction of the Widdifield & Button, practice runs were made before the beginning of the tests, and thus the fact was developed that the Rote brake, whose loud challenge of the Westinghouse to a "comparative test" under somewhat peculiar conditions will be still remembered by many, did absolutely no effective work toward stopping the train, or so near to nothing that it practically amounted to that. At the end of 30 days' further time which has been allowed it the result may be different.

During the practice tests the Widdifield & Button likewise developed a defect which, if not corrected, may well be expected to be fatal to it. The Widdifield & Button uses the power and motion of the drawbar, not to apply the brakes directly, but to press a friction wheel against another one on the axle, and thus wind up the brake-chain. When cars equipped with this brake are at the front of the train and followed by a number of other cars at the rear to furnish a constant pressure against them, tests on the Lehigh Valley have shown that it works very smoothly and well, enough so at least to cause the officers of that line to feel sufficient hope in its success to provide the necessary 50 cars for the test.

But under the conditions of the test, all the cars in the train, except the caboose in the rear, must be provided with the given brake, and when the cars came to be tested under these conditions their behavior was very different. In the preliminary tests a succession of violent shocks ran through the train. When the brakes were on at all at the rear of the train, or in any other part, they went on hard. That drew out the train; that took off a great many brakes; that left the rear cars free to lurch up toward the engine; that put the brakes on again; that drew out the train again with a jerk, and so on, many times in succession, enlarging the knowledge of the entire train crew as to the possibilities of railroading, by sending them sprawling all over the cars. The explanation of the inventor was that his adjustment had been bad by making his brakes too sensitive, and this was so far supported by the result of the regular tests that a slight readjustment made a very material improvement in the severity of the bumps and in the length of the stops as well, although the same rapid succession of brakes-on and brakes-off was observed throughout the rear half of the train, and in the rear quarter of the train with dangerous severity. This has led to the exclusion of the train from the 50-car tests on the ground of safety, unless the inventor can, as he claims he can, still further improve his adjustment so as to obviate these violent shocks on a repetition of the first tests.

Whether he can or not remains to be determined, and until it is determined he is entitled to the benefit of the doubt, especially in view of the improvement which he had already effected; but the extraordinary fact is that, with ample opportunity to make similar tests before under what was plainly the least favorable condition for the action of such brakes (with no unbraked cars behind them to crowd constantly on them and keep the buffers always in compression), not a single test had ever been made in that way by the inventor, so that he was honestly ignorant of the great danger which threatened him. The mistaken readiness of inventors to deceive themselves by nursing their projects as one might a sick baby, giving it always every chance to make the best possible showing, even in their private tests, was never better illustrated.

As we have said, it is as yet unfair to prejudge the final outcome with either of the brakes which have so far been so unfortunate, but such untoward results show what is really a chief advantage of such thorough tests as these; that they tend to weed out and condemn the hopelessly bad as well as to establish the goodness of the best. No device reaches the stage where it is entered in a costly competitive test without having *prima facie* merits which are at least sufficiently plausible to mislead the judgment of fairly intelligent men who put their money in it. When an invention is good enough to do that it may be counted on as tolerably certain that it is good enough likewise to mislead the judgment of the officers, one or two or three or half a dozen railroad companies, simultaneously or successively, and to float along for years in a hand-to-mouth struggle for existence injurious to all parties. The cold precision of the dynamometer car and the stop-watch tend to put a speedy end to such unhealthy existence when handled, as in this case, by men equally disinterested and only anxious to know the truth. Divorced from the nursing care which interested parties can hardly help giving, the defects of every device, and whether they are inherent or remediable, are pretty sure to come out if proper care be taken, and this makes it well worth while to test thoroughly the most dubious device, since, however strongly a man's judgment may disprove of an invention which keeps its head above water at all, he is conscious, if he is a reasonable man, that there is a certain possibility that his judgment is quite at fault, until the contrary has been definitely proved.

The expense incurred by the Chicago, Burlington & Quincy Railroad alone in conducting these tests is a large one, and while there can be no question that the information gathered will be worth to that road alone many times its cost, it is fortunate indeed that some one company was found with courage enough to recognize the necessities of the situation by doing at its own cost what undoubtedly ought in equity to be at the cost of the railroad system as a whole, since it is for the common benefit. To Mr. Godfrey W. Rhodes, Superintendent of Motive Power of that line, is due a large part of the credit of conceiving and organizing these tests and of superintending their progress, so that the many troublesome details which must all be attended to to keep the tests running smoothly shall not interfere with their progress. To mention one thing only, 6,000 car wheels, weighing nearly 1,600 tons, have had to be collected and must be shifted back and forth into the five trains of 50 cars between the tests, so as not to interfere with their progress. Due arrangements must also be made to avoid interfering with regular trains, and the mere contingencies of breakage and trifling accidents naturally incident to making a series of "emergency stops" with heavy trains of 25 to 50 cars inevitably add much to the care need d to keep everything moving smoothly. In spite of these difficulties the tests have so far been continued according to schedule, except as the unreadiness of the competitors has compelled variation, and probably will to the end.

The interest shown in the tests by railroad men generally has naturally been great. The unheard-of result of getting together four members out of a committee of six—Messrs. Rhodes, Lentz, Hackney and Welsh—from remote parts of the country to give personal attention to the work of their committee, is alone evidence of this. Mr. W. T. Hildrup and Mr. D. H. Neale, of this journal, are the only members of the committee not able to be present. Mr. A. M. Wellington, of this journal, is by election of the committee and the competitors acting as referee. The large staff of observers and assistants necessary to take the various records which are taken on the engine, first car, middle car, and last car of the train are furnished by detail from the technical staff of the Chicago, Burlington & Quincy, the Pennsylvania, the Pittsburgh, Cincinnati & St. Louis and other roads having men in its service trained to such work, being the only part taken by other roads than the Chicago, Burlington & Quincy in the expense of the tests, beyond a small sum from the funds of the Master Car-Builders' Association. In all, some 50 persons whose duty or interest it is to bring out every good or bad point which the tests develop in each brake, ride on the train. It will be singular if this does not insure bringing out some pretty definite knowledge on every point of the brake question as it exists to-day, and the contrast between the brake question and the coupler question is evident in the fact that, although there are only five competitors on the ground to-day, the tests include every brake which has attained any considerable favor in a practical way.

A comparison of these tests with the famous brake tests of Capt. Douglas Galton and Mr. Westinghouse in 1878, which we pronounced at the time to be "the most brilliant in the history of engineering," naturally suggests itself. Those tests were confined to passenger trains, and those of no extraordinary length or weight. The records taken were: (1) A diagram of the speed, showing the decrease at all points during the stop, (2) a diagram of the pressure on brake blocks, (3) a diagram of the tangential stress from the brake-blocks, or rate of retardation, (4) a diagram of the pull on the draw-bar. Those various records shed a flood of light on the general laws of brake friction and on the actual action of power brakes in practice. This evidence, once gained, may be duplicated, but can never much be added to within the range of the tests, which substituted definite knowledge for what had heretofore been mere guesswork, and largely mistaken guess-work. It was this which gave them their peculiar value, which the present tests cannot hope to have.

On the other hand, these tests will supplement the Galton-Westinghouse tests in several respects, as well

as much extend the field covered by the latter. The records taken are these:

1. On the engine the steam pressure and pressure or vacuum of air is carefully noted by two observers at critical points during the four stops in each run, which are made in rapid succession.

2. Immediately behind the engine comes a dynamometer car, which gives a continuous record of the pull or push on the tender draw-bar during every stop. This record promises to have a unique value which was not fully foreseen, perhaps, by any of those taking part in the tests until after they had been begun, viz.: it affords the means of accurately subdividing the total work done between the engine and tender-brakes and the train brakes proper. This has never heretofore been done, and it promises to develop some very striking facts, which may prove of great practical value. The dynamometer record likewise furnishes a check upon how and when the work is done by the brakes in front of and behind it. The labor of working up these results will be considerable, but can hardly fail to be highly instructive. In a general way, we may say now that the salient lesson from the diagrams appear to be the enormously disproportionate amount of work done by the engine, even with the best train brakes.

3. A graphical record is obtained in the middle car of the speed at each point of the stop and of the pull on the brake rods, simular to those obtained in the Galton-Westinghouse tests. The tangential stress on the brake-hangers from the brake-block is not observed; but the omission is not material, since the aggregate for the train is given by the other records.

4. On the rear car of the train gauge readings of the pressure in the brake-pipe, reservoir and brake cylinder are made during each stop, and various details of the behavior of the brakes noted. A telephone connection between the engine and each car enables simultaneous signals to be transmitted and communication to be maintained.

Notes are also taken of all accidents to draw-gear or other parts of the train, quite a number of which have already occurred. The general tests, as now conducted, include three runs of four stops each for: (1) 25-car mixed loaded and empty trains; (2) 50-car empty trains; (3) 50-car mixed trains; (4) 50-car loaded trains, varying somewhat from the previously published programme. The necessity of giving so many stops for each train, to eliminate accidental differences and give a fair average, has already appeared. Various special tests follow the general tests.

So broad a programme and so many repetitions of test stops may seem at first sight unnecessary, but it is an especially commendable feature of the tests, since it gives perhaps four times as much certainty as if the tests were only half as many. The number of breakages and slid wheels which occur in so many tests will alone furnish as valuable a record of endurance as a year or two of ordinary work, in which not a single instance might occur requiring special effort to make a quick stop, which is naturally the most trying to the apparatus. But the most valuable results of the tests cannot be developed until considerable time and labor has been given to the complete records.

NEW YORK GRAIN RECEIPTS—JUNE AND THE HALF YEAR.

The New York grain receipts in June last were larger than in May even, and larger than in any previous June since 1881, and have been exceeded only in 1879, 1880 and 1881. The rail receipts, however, were not so large as in some other years, as was to be expected, the rates being 40 per cent. higher than last year and the year before, and also much higher than in 1879 and the last third of the month in 1881, which was the beginning of the railroad war of that year. The total New York receipts (grain and flour) and its receipts by rail in June in each of the last ten years have been, in bushels:

Year.	By rail.	Total.	Year.	By rail.	Total.
1877	2,321,906	6,649,215	1882	5,677,947	9,224,358
1878	4,226,278	11,130,399	1883	4,370,661	10,945,621
1879	8,765,703	13,949,616	1884	6,846,667	10,431,998
1880	10,332,124	21,682,554	1885	6,276,884	12,256,275
1881	8,663,416	15,589,526	1886	6,031,529	12,457,722

In view of the difference in rail rates, it is surprising that the rail receipts this year should have so near to those of the last two years. They were largely exceeded only in 1879, 1880 and 1881, and only in 1880 were rates maintained all the time. Then, however, the total movement was so great that it taxed the ability of all the carriers, though the rate was 30 cents per 100 lbs., Chicago to New York, against 25 to 15 in 1881, 15 in 1884 and 1885, and 25 this year, modified by a cut of probably not more than 2½ cents on a considerable fraction of the receipts.

In all these statements of New York receipts, however, it must be remembered that the whole does not pay Chicago-New York all-rail rates, but that a very large quantity is brought to Buffalo and Erie by lake and taken thence to the seaboard by rail in competition with the canal, but not with the lake, including all the large shipments of flour from Lake Superior ports.

In these ten years the rail receipts have been the following percentages of the total receipts at New York, in June:

1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	1885.	1886.
34.9	38.0	62.8	47.7	55.6	61.5	39.9	65.6	51.2	48.4

In five of these ten years the railroads have brought more than half of the New York receipts, but in only two of these years, 1881 and 1882, were rail rates as well maintained as they were this year.

The quantity brought by canal and coastwise this year, in June, was 6,426,193 bushels, which is the largest since 1883, when it was 6,574,957, but only 595,566 bushels (10 per cent.) more than last year. The water receipts this year were largely exceeded only in 1880, when they were 11,350,430 bushels.

The canal, however, is not now a competitor for the flour brought to the seaboard, though this still goes by lake in large quantities to Buffalo and Erie, and the proportion of grain exclusive of flour brought by canal in successive years has been much greater than the above figures indicate. For seven years the canal shipments in June have been the following percentages of the *grain* shipments:

1880.	1881.	1882.	1883.	1884.	1885.	1886.
56.7	49.9	42.0	68.0	40.2	56.7	62.0

Thus the proportion of the unground grain brought by canal this year was larger than in any other of the seven except 1883. Our records do not separate canal from coastwise receipts previous to 1880, but the total water receipts of grain exclusive of flour were 41.8 per cent. of the total in 1879, 68.5 in 1878, and 74 per cent. in 1877, so that the canal has held its own very well in the business for which it competes. About one-fifth of the total receipts this year were flour.

The distribution of the rail receipts in June among the several railroads was something like that in May, in that the Erie brought much more than any other railroad; but it is not so far ahead as it was in May, nor did the Lehigh Valley bring so large a proportion of the business. The New York Central and the West Shore were the chief gainers, bringing 37.5 per cent. of the whole in June against 28.9 in May. For seven years the receipts by each of the railroads in June have been in *thousands* of bushels:

Bushels:	N. Y. Cen.	Erie.	Penna.	Lack.	W. S.	Other.
1880	5,217	3,506	1,586	.....	.....	23
1881	4,105	2,283	1,220	.....	.....	55
1882	2,487	1,545	1,575	.....	.....	32
1883	1,508	1,673	912	235	.....	43
1884	2,222	2,464	771	488	858	43
1885	2,227	1,823	1,002	377	780	67
1886	1,578	2,022	562	510	679	679
Per cent. of total:						
1880	50.5	33.9	15.4	.....	.....	0.2
1881	47.4	37.9	14.1	.....	.....	0.6
1882	43.8	27.9	27.7	.....	.....	0.6
1883	34.5	38.3	20.8	5.4	.....	1.0
1884	32.5	36.0	11.2	7.1	12.6	0.6
1885	35.5	29.0	16.0	6.0	12.4	1.1
1886	26.2	33.5	9.3	8.4	11.3	11.3

It is not likely that the "other" roads aside from the Lehigh Valley brought more than 60,000 bushels last June, which would leave to the Lehigh Valley 619,000 bushels, or 10.3 per cent. of the whole receipts by rail—more than was brought by the Pennsylvania or the Lackawanna, and nearly as much as by the West Shore. The three new roads brought 30 per cent. of the whole, so that while the total rail receipts were larger this year than in 1882, the receipts by the three old roads were 26 per cent. less—4,162,000 bushels instead of 5,647,000. The Pennsylvania has suffered especially this year, having brought 44 per cent. less than last year, while the total rail receipts were only 4 per cent. less. It has never brought so small a part of the New York receipts at this season.

For the six months ending with June, the New York receipts (grain and flour) have been, in bushels:

Year.	Total.	By rail.	P. c. by rail.
1877	28,221,875	19,465,606	69.0
1878	60,652,094	40,535,113	67.0
1879	61,406,857	51,462,529	83.8
1880	65,962,949	45,297,995	68.7
1881	62,321,049	47,889,458	76.9
1882	41,070,212	31,175,267	75.9
1883	52,604,898	40,554,059	77.0
1884	42,265,135	34,155,615	80.8
1885	57,305,361	49,007,454	85.5
1886	52,499,420	40,898,861	77.9

Thus while the June receipts this year were the largest since 1881, the receipts for the six months were the smallest since 1877, except 1882, when we were receiving there mains of the worst harvest of recent years, and 1884. The decrease from last year is 8½ per cent. An exceptionally large part of the half-year's receipts arrived in May and June this year—24,018,000 out of the total 52,499,000 for the half-year, while last year 20,459,000 were received in the two months named out of the 57,305,000 for the half-year. That is, in the four months before the opening of the canal the New York receipts were 28,481,000 bushels this year, against 36,846,000 last year. An export demand for wheat in the last two months has had much to do with this change

The receipts of grain and flour at New York for the half year by each of the railroads have been, for the last seven years, in *thousands* of bushels:

1,000 *bu.*	N. Y. Cen.	Erie.	Penna.	Lack.	W. S.	Other.
1880	23,218	14,133	7,592	.....	.....	445
1881	19,329	18,073	9,777	.....	.....	710
1882	16,109	9,567	5,145	.....	.....	354
1883	18,246	13,173	6,167	2,595	.....	373
1884	15,136	9,810	4,240	2,477	2,142	350
1885	18,474	11,574	8,438	3,800	5,847	474
1886	13,108	10,905	4,499	6,098	3,116	3,173
Per cent.:						
1880	51.3	31.2	16.6	....	...	0.9
1881	40.4	37.7	20.4	....	....	1.5
1882	51.7	30.7	16.5	....	....	1.1
1883	45.0	32.5	15.2	6.4	....	0.9
1884	44.3	28.7	12.4	7.3	6.5	0.8
1885	37.7	24.4	17.2	7.8	11.9	1.0
1886	32.0	26.7	11.0	14.9	7.6	7.8

Compared with last year there has been a decrease of 8,109,000 bushels (16¼ per cent.) in the rail receipts, but the decrease in the receipts by the three old railroads has been 10,374,000 bushels, or nearly 27 per cent. The Lackawanna carried 60 per cent. more than ever before, but the greatest gain is by the Lehigh Valley, to which we may credit at least 2,800,000 of the 3,173,000 bushels brought by unspecified roads. The West Shore brought 47 per cent, less than last year, when it was struggling against fate for existence. The Lehigh Valley has taken just about as much as the West Shore has lost. The New York Central has suffered most, though the Pennsylvania's rate of decrease is larger. The Central has not brought so little grain to New York for many years, and even the Central and West Shore together brought but 16,224,000 bushels, against 24,321,000 last year—39.6 per cent. of the whole against 49.6. The share this year is smaller than the Central alone ever had previous to last year. The Erie has suffered comparatively little, but until May it was far behind last year, having brought 6,155,000 bushels (22 per cent of the whole) against 8,361,000 (23.1 per cent.) last year. It has had an extraordinarily large share of the business for the last two months—4,750,000 bushels, and 36⅝ per cent of the whole, against 3,613,000 and 28 per cent last year. It was behind in the east-bound pool May 1, but this extraordinary business must have gone far to make it even, if not put it ahead. It gets the benefit of most of the large shipments taken from Chicago by the Chicago & Atlantic at less than the regular rates, though it is understood that it gets its full proportion of the regular rates for its part of the haul. These shipments apparently affect the Lackawanna's business, which has been very irregular, and less in June than in any other month of this year. In successive months it has delivered at New York:

	March.	April.	May.	June.
Bushels	2,477,686	644,101	704 245	509,847
P. c. of rail grain	24.6	18.3	10.2	8 4

The Lehigh Valley's business may be traced closely by the receipts by all the unnamed roads, as rarely do those of all except the Lehigh Valley reach 60,000 bushels in a month. The receipts by "other" roads have been:

	Jan. and Feb.	March.	April.	May.	June
Bushels	498,078	476,095	519,932	909,580	679,463
P. c. of rail rec'ts	3.5	4.7	14.8	14.4	11.3

It first began to take a considerable amount in March, and has had a larger share of the business than any other new road since, but shows a considerable decrease from May to June. It carries the grain brought by the Wabash from Chicago, as well as other Wabash grain, and it is probably taken at a small reduction from the regular rate. While it has not succeeded in getting much flour, its share of the unground grain is only the more noticeable. In June, for instance, it brought to New York four times as much of this as the Pennsylvania, nearly four times as much as the Lackawanna, and only 42 per cent. less than the New York Central.

The revival of the grain business in the last two months was hardly looked for, though it was perfectly well known that Western elevators were holding extraordinary stocks of wheat. But stocks had been enormous all winter, and owners had held it so persistently that it seemed not improbable that they might continue to hold. The movement since April has been positively large, and by far the larger part of the wheat, which is spring wheat chiefly, has gone to New York. The new crop of winter wheat is now moving, but usually it is felt first and most at Baltimore. Apparently the condition of things in the new crop year will be the reverse of the condition in the last one. Then there was a very light crop of winter wheat, which was especially unfavorable to Baltimore and Philadelphia; this year it is the spring wheat which will be a short crop, and New York and Boston will suffer most thereby, especially as they are the great flour markets, and a much larger proportion of spring than of winter wheat is ground

in the West. Conditions are favorable for a heavy corn movement, however, there being great quantities in the country which can be spared if the coming crop turns out well, and the present prospect being favorable for the coming crop. Corn rarely suffers much damage after July except from frost, and the crop this year is earlier than usual, so that the danger from frost is less than usual.

Chicago Freight and Live Stock Shipments Eastward—June and the Half-Year.

The reports of Chicago shipments of through freight to the East still lack the shipment over the Chicago & Atlantic, which greatly reduces their value for purposes of comparison. For the month of June the reported shipments (live stock and dressed beef not included) have been :

Year.	Tons.	Year.	Tons.
1879	260,234	1883	137,573
1880	223,977	1884	282,165
1881	242,463	1885	237,469
1882	115 805	1886	123,197

Even if the Chicago & Atlantic carried as much as 30 per cent. of the whole this year, the total shipments were but 175,996 tons, which is less than in any other year except 1882 and 1883. It is not probable that the Chicago & Atlantic carried so much, and there is no doubt that the shipments this year were very small, although the records of the total trunk line shipments eastward in June shows them to have been larger this year than in any other since 1881. Neither is there any doubt that the profits on the Chicago shipments were much larger this year than they were last year or the year before, when nearly all of the business was carried at bare cost; but for the two years previous the shipments were smaller than this year even, so that it is safe to say that the earnings from Chicago shipments were after all as large as in any other June since 1881.

For the half year ending with June the reported shipments, which lack the Chicago & Atlantic shipments for four months of this year, have been :

Year.	Tons.	Year.	Tons.
1879	1,489,142	1883	1,209,078
1880	1,197 307	1884	1,6 1,525
1881	1,382,087	1885	1,830 972
1882	1,102,680	1886	949,493

A very large allowance for the unreported shipments of the Chicago and Atlantic this year is 240,000 tons, and this would make the total shipments 1,189,498 tons, which is less than in any other year reported except 1882, though not much less than in 1880 or 1883. The lakes opened earlier than usual, and they have doubtless taken a larger proportion of the grain, and especially of the flour, than usual, and what goes from Minneapolis to Duluth or Washburn is so much taken from Chicago or Milwaukee; but, nevertheless, in view of the large trunk line shipments east of Buffalo, Pittsburgh, etc., it is surprising to see the Chicago rail shipments so small.

The record of the live stock and dressed beef shipments is complete, though we understand that the Chicago & Atlantic does not report these since June. These naturally fluctuate much less than the other freight shipments, as they are nearly all for immediate consumpt on, the exception being live hogs, which go to Eastern packing houses. These live stock and dressed meat shipments have been, in tons :

June.		Six months.	
1885.	1886.	1885.	1886
64,906	78,169	422,410	445,443

Thus the June shipments were 20.4 per cent. larger than last year and the shipments for the half year were 5½ per cent. larger, and the total shipments in June were 63½ per cent. of the reported shipments of other freight and 44 per cent. of our liberal estimate of the total shipments; while the earnings must have been fully 70 per cent. of the earnings from all other freight, which shows the very great importance of this traffic. Compared with last year the earnings on it in June were fully 75 per cent. greater this year, chiefly on account of the restoration of rates. The increase for the half-year was not at so great a rate, however; for the advance in rates this year was not made till March, and the very low rates of June last year did not extend over the first three months of the year.

The shipments of live cattle and dressed beef in June were, in tons :

	1886.	1885.	Inc. or Dec.	P.c.
Live cattle	28,000	32,150	— 4,150	12.9
Equal to beef	15,960	18,326	— 2,366	12.9
Dressed beef	23,213	18,370	+ 4,843	26.4
Total beef	39,173	36 693	+ 2,477	6.7
P.c. shipped dressed	59.2	50.0	+ 9.2	

The dressed beef shipments were nearly the same as in May (50 tons more), and larger than in any previous month, except last October. The cattle shipments were also larger than in May, but less than in April, January, and every month of last year but one.

For the four months ending with June, which was the period of the advanced rates this year, the shipments have been :

	1886.	1885.	Inc. or Dec.	P. c.
Live cattle	110,237	137,389	— 27,152	19.8
Beef	62,835	78,312	— 15,477	19.8
Dressed beef	85,444	69,751	+ 15,693	22.5
Total	148,279	148,063	216	0.1
P. c. shipped dressed	57.6	47.1	10.5	....

Thus the gain made by dressed beef in June was similar to that of previous months since the advance in rates. Before the advance, in January and February, 56.8 per cent. of the total was shipped dressed, so that the dressed beef has made a slight gain since the advance. Boston is the only large seaboard city which receives most of its supply of beef dressed, but the dressed beef has nearly put an end to live stock shipments from the West to interior points in New York, and especially in New England.

Further west there is a very large population so near Chicago that the advantage of shipping the beef dressed to them must be less than when the distances are great and so more wearing to cattle and more expensive on account of the necessary feeding, etc., but these places do not depend upon Chicago for their supply, but receive directly from other markets and from their own vicinity, so we may not conclude that the live cattle form nearly the whole supply of the less distant country. But the tendency for the shipments of dressed beef to increase and of live cattle to decrease continues, though naturally, the field having already been occupied for some years, the change is not so rapid now as it was some time ago.

Provision Exports.

The provision exports in June, including pork, beef and dairy products, were nearly the same in value this year as last, but were 14 per cent. less than in 1884. There was a large decrease from last year (31½ per cent.), however, in the value of the exports of live cattle, which are not included in the above total Of all products of cattle, including butter and cheese, the values in June are about the same as last year. It follows that there was little change in value of pork products. There was, however, some increase in the quantity of the latter, and it has been in *millions* of pounds, in June of successive years :

1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	1885.	1886.
50.1	69.3	83.4	111.3	60.9	49.4	44 2	59 2	66.3	69.3

Thus the June exports this year were exceeded only in 1879 and 1880. These exports of pork products have varied but little from month to month this year, the largest (January) being 69.7 and the smallest (March) 63.5 millions of pounds.

For the six months ending with June these exports have been, in millions of pounds :

Year.	Million lbs.	Year.	Million lbs.
1877	385.0	1882	382.9
1878	653.8	1883	345.6
1879	649.1	1884	286.2
1880	702.8	1885	404 1
1881	604.1	1886	407.2

Thus the quantity this year is the largest for five years, though very little more than last year; but it is much less than in any of the four years from 1878 to 1881.

The values for the half-year have been for six years :

1881	$53,654,626	1884	$28,106,134
1882	38,987,079	1885	32,822,789
1883	27,552,925	1886	26,193,930

Thus the quantity being a trifle greater, the value is 14 per cent. less than last year and nearly as little as in 1884, when the quantity was 42 per cent. less, the average value having fallen from 9.82 cents to 6.92 cents per pound.

The value of all exports of cattle, dairy and pork products meanwhile has been :

1881	$71,165,337	1884	$43,837,419
1882	50,708,190	1885	48,336,700
1883	52,515,437	1886	40,379,291

Thus the value this year was less than in any other of the five, being 16½ per cent. less than last year, and 43 per cent. less than in 1881.

The value of cattle products have decreased less than that of pork products, having been :

1881	$17,510,711	1884	$15,731,285
1882	11,721,111	1885	15,513,911
1883	14,962,512	1886	12,185,352

The live cattle are not included here, but the number and value exported in the six months for the last three years have been :

	1884.	1885.	1886.
Number	77,002	73,332	53,841
Value	$7 772,173	$7,300,482	$5,073,501

The decrease in these since last year is 26½ per cent. in number and 30¾ per cent. in value—much greater than in pork and beef products. Including catle and provisions, the values of our exports this year have been $10,184,390 (18¼ per cent.) less than last year, but only $6,156,800 (11⅛ per cent.) less than in 1884.

The one favorable feature in the situation is that we are again making large exports of pork, bacon and lard, though at very low prices. It seemed at one time as if we were losing our foreign market for these articles, but this was largely because the light corn crops had reduced our production, while the growing population had increased our consumption. But it seems surprising that there has been no increase but actually a decrease in the exports of beef and other products of cattle. There have been a great many new ranches stocked in the last five years and great efforts made to increase the stocks on the old ranches, in spite of which the exports indicate that the home consumption, during a time of dull business and apparently general economy, has increased faster than the production.

The railroads west of Chicago, though they have completed no permanent arrangement for coöperation, restored their rates this week, having agreed to do so pending negotiations for pooling or other combinations. The roads in the Western (Council Bluffs) and Northwestern (St. Paul) Associations have reported their contracts with shippers, which are said to be few in number, and except the famous Hammond contract for cattle to be slaughtered, not very important. The Chicago, St. Louis & Missouri River Passenger Association, which covered nearly the same field for passengers as the Western and Southwestern associations for freight, was formally dissolved, but at the same time it was agreed to establish and maintain rates until Sept. 15, and meanwhile to establish a money pool covering the whole business, and Mr. E. P. Wilson, Arbitrator of the old Association, was chosen Commissioner to organize the proposed new organization, which if established must be much more effective in maintaining rates than the old one. The roads in the Western and Northwestern associations have made a similar agreement—to maintain rates until Sept. 15 without an organization, the managers meanwhile to plan a money pool covering both passenger and freight traffic in the whole field—which is very nearly what Mr. Cable proposed. These arrangements cannot be easily made, and it is not yet certain that all the lines will cooperate in making them; but if it is agreed beforehand to submit all questions of difference to arbitration, it ought to be possible to carry out the plan and put an end to the very great and frequent irregularities in rates, which have been common of late years in this territory. If carried out it is likely to be one of the most important railroad agreements ever made

June Accidents.

Our record of train accidents in June, given on an other page, contains notes of 22 collisions, 51 derailments and 2 other accidents; a total of 75 accidents, in which 38 persons were killed and 86 injured.

Two collisions, 9 derailments and 1 other accident caused the death of one or more persons each; 6 collisions and 9 derailments caused injury to persons, but not death. In all, 12 accidents caused death and 15 injuries, leaving 48, or 64 per cent. of the whole number, in which there was no injury serious enough for record.

The 22 collisions killed 7 and injured 42 persons; the 58 derailments killed 23 and injured 44, while in the 2 other accidents 3 persons were killed.

Of the killed 18 and of the injured 63 were railroad employés, who thus furnished 54½ per cent. of the killed, 73 per cent. of the injured and 68 per cent. of the whole number of casualties.

As compared with June, 1885, the number of accidents was the same, but there was an increase of 9 in the number killed and a decrease of 29 in the persons injured.

These accidents may be classed as to their nature and causes as follows :

COLLISIONS:		
Rear	13	
Butting	8	
Crossing	1	
		— 22
DERAILMENTS:		
Broken rail	3	
Broken bridge	1	
Spreading of rails	8	
Broken wheel	3	
Broken axle	4	
Broken truck	1	
Accidental obstruction	1	
Cattle	3	
Misplaced switch	4	
Rail removed for repairs	1	
Purposely misplaced switch	8	
Malicious obstruction	2	
Unexplained	12	
		— 51
OTHER ACCIDENTS:		
Boiler explosions	1	
Broken parallel rod	1	
		— 2
Total number of accidents		75

Five collisions were caused by trains breaking in two; four by mistakes in orders or failure to obey them; two by misplaced switches; one each by failure to use signals, by a flying switch and by a car run out of a siding upon the main track.

A general classification of these accidents is made as follows :

	Collisions.	Derailments.	Other.	Total.
Defects of road	..	12	..	12
Defects of equipment	5	8	2	15
Negligence in operating	16	5	..	21
Unforeseen obstructions	1	4	.	5
Maliciously caused	..	10	.	10
Unexplained	..	12	..	12
Total	22		2	75

Negligence in operating is thus charged with 28 per cent. of all the accidents, defects of road with 16, and defects of equipment with 20 per cent.

A division according to classes of trains and accidents is as follows:

Accidents:	Collisions.	Derailments.	Other.	Total.
To passenger trains	1	10	..	11
To a pass. and a freight	7	..	..	7
To freight trains	14	41	2	57
Total	22	51	2	75

This shows accidents to a total of 97 trains, of which 19 (19½ per cent.) were passenger trains and 78 (80½ per cent.) were freight trains.

Of the total number of accidents 42 are recorded as happening in daylight and 33 at night.

The month was fairly favorable, as far as the weather was concerned, and was also generally a month of moderate traffic, and might thus be expected to have the light record which it shows. The worst feature is the large number of malicious derailments. There were 10 of this class and of these 8 were the result of purposely misplaced switches, and were accompaniments of the switchmen's strike in Chicago.

The large number of persons killed, with so small a number of accidents, was due to the occurrence of four or five accidents, in each of which there were a number of persons killed.

For the year ending with June the record is as follows:

	Accidents.	Killed.	Injured.
July	76	28	75
August	92	37	172
September	91	25	98
October	123	36	134
November	96	19	118
December	74	31	153
January	94	40	90
February	98	21	157
March	81	49	131
April	66	23	105
May	93	23	170
June	75	33	86
Total	1,059	365	1,489
Total, same months, 1884–85	1,249	325	1,617
" " " 1883–84	1,436	447	2,028
" " " 1882–83	1,604	431	1,688

The yearly average for the four years was 1,337 accidents, 392 killed and 1,701 hurt The monthly average for the year was 88 accidents, 30 killed and 124 injured.

The averages per day for the month were 2.50 accidents, 1.10 killed and 2.87 hurt; for the year they were 2.90 accidents, 1.00 killed and 4.08 injured.

The average casualties per accident were, for the month, 0.440 killed and 1.147 hurt; for the year, 0.345 killed and 1.406 injured.

Both the month and the year show light records and make favorable comparisons with previous years.

Of 11 railroads which report their June earnings this week, seven are Southern roads and all are small ones. Only three show any decrease in earnings, and there are some large gains, as 30 per cent. by the Alabama Great Southern, 25½ by the Georgia Pacific, 23½ by the South Carolina, and 28¾ by the Vicksburg & Meridian. The Southern roads had not been doing very well, and the change is encouraging. Altogether the percentage of increase of the roads reporting this week is not so great as of those which have heretofore reported for the month. The 66 railroads that have reported so far have earned in June:

	1886.	1885.	Increase.	P.c.
Earnings	$21,703,002	$19,428,268	$2,274,734	11.7

This is a very large gain over a very unfavorable year.

The weather since we last noted the condition of the crops has been generally unfavorable for the spring wheat, drought continuing. Corn, which was beginning to suffer in Kansas and elsewhere, has been relieved by rain. The Department of Agriculture notes that the spring wheat condition 83½, reported July 1, should not be compared with the condition 96at the same date last year in order to estimate the prospects this year, because the crop depreciated last year from 96, July 1, to 86 at harvest. The condition this year July 1 was 13 per cent. below the condition July 1 last year, and some have calculated the effect on the yield by subtracting 13 per cent. from the crop of 145,000,000 bushels of spring wheat last year, which would leave about 126,000,000 bushels. But the Department itself June 1 said the condition at that time (98½) indicated a crop of about 150,000,000 bushels, and the reduction of condition thence to July was to 83½, which is 15¼ per cent., which would leave but about 127,000,000, which happens to be very close to the other estimate, while the Department reports that the conditions July 1 indicated a crop of about 139,000,000. The fault is with the Department report for June, which showed the acreage to be nearly the same as last year, and the condition 14½ per cent. better than the condition at harvest last year, which would add 21 millions to the 145,000,000 reported as last year's crop, making it 166,000,000 instead of the estimated 150,000,000. The fall from 98½ to 83½ during June would take 25 millions from the 166 millions, and leave 141 millions July 1—about 13 millions more than estimated last week. The damage done during this month may have left a spring wheat crop of about 136,000,000, and a total wheat crop of about 430 millions.

The movement of the new wheat crop appears first, as usual, in the receipts of St. Louis, which, in the week ending July 10, received 734,246 bushels, which is 83,000 bushels more than the aggregate wheat receipts of the other seven Northwestern markets, and nearly as much as its own receipts for the entire nine weeks previous. These first receipts of themselves indicate that the crop is good. Last year the St. Louis receipts did not begin to increase until the week to July 25, and in the entire season they never became so large as in this first week of the movement of the new crop this year, the largest last year being 638,969 bushels, in the second week of August, and 590,082 in the third week. In favorable years the St. Louis wheat receipts have sometimes been more than a million bushels in a single week. The heavy receipts there are usually in July, August and September, falling off about at the time when Duluth begins to receive the new wheat of the year.

California is beginning to grind its wheat before exporting it. In 1884–85 but 6½ per cent. of the wheat exported was ground, while in 1885–86 no less than 21¼ per cent. was flour; the flour exports increased 176 per cent., while the unground wheat exports decreased 28 per cent. This is according to a local San Francisco report. The Bureau of Statistics reports that in the first half of this year (which is the last half of the above crop year), the shipments of wheat from San Francisco and Portland, Ore., together were very nearly the same this year as last, while the flour shipments were equivalent to only 3,025,413 bushels this year, against 3,854,731 last year, and 16.8 per cent. of the total was flour this year, against 20 per cent. last year. From the Atlantic ports, meanwhile, the flour made 57 per cent. of the whole last year, and 43 per cent. this year. It is supposed that flour is less likely than wheat to make the long voyage from San Francisco to Europe, crossing the tropics twice without injury; but most of the San Francisco flour goes to England, and it goes in considerable quantities. For the benefit of the Panama canal, which seems to need all the help it can get, it may be said that it would be much more likely to get cargoes of flour than cargoes of corn bound from our Pacific ports to Europe.

The Chicago, Burlington & Quincy Railroad is not only engaged in making the best tests ever made of freight train brakes, but is investigating the question of couplers in an equally sensible if smaller way. It has for some time been experimenting with the Janney coupler, and is now preparing to put on 50 cars each of the Ames, Perry, Janney and Hein and observe their record in service, careful arrangements being made to secure the return of all broken pieces, a heap of which tells a better story as to the real excellencies and defects of such devices than any amount of abstract discussion, or even any ordinary number of special tests of strength.

We may add that this practice of requiring the broken pieces of parts which fail in practice to be returned to the headquarters of the Superintendent of Motive Power is followed out in many things, and has often proved of great value in indicating slight defects of detail which are easily corrected when known, but which are hardly of so serious a nature as to become soon known from the number of cases of failure which come within the cognizance of any one person. But little trouble and less expense is involved in the practice, and it is one deserving of more general imitation.

There is a new project for another railroad from New York to the East. The New York, Danbury & Boston Company purposes to build a railroad from a junction with the Surburban Rapid Transit Railroad north of the Harlem River northeast to a junction with the New York & New England Railroad at Danbury, Conn., 54 miles from New York, and 180 miles from Boston, making a line between New York and Boston of the same length as that by way of New Haven and Springfield, the shortest route, by the Air Line, being 220 miles.

It seems strange at first sight that New York should have but one railroad connection with New England, with which its intercourse is so great; but there have been two serious obstacles in the way of a competing line. One is the laws of Connecticut, which require cash subscriptions of so large an amount that the speculative railroad builder, who operates without capital, finds difficulty in exercising his industry there; and the second, and now the most formidable, is the difficulty of securing an entrance into the city of New York. In this case it is proposed to have the New York terminal station at the elevated railroad station on One Hundred and Twenty-fifth street, more than four miles north of the Grand Central Station. This can be easily but not quickly reached from the east side of the city of New York, but a railroad to Boston with no station further down-town would be at a very great disadvantage, and could not hope to get much suburban traffic, such as a new railroad to the heart of the city might develop.

In the case of this company the Connecticut laws will not form much of an obstacle, because very little of the railroad will be in Connecticut. But the lack of a satisfactory entrance into the city is so great a defect that it is not likely that the New York & New England would give up its connection with the New Haven road for the sake of the longer haul on Boston traffic which it would get by the proposed line.

The city entrance would be substantially like that of the New York City & Northern at One Hundred and Fifty-fifth street. The elevated railroad managed to run an express train to Rector street in about half an hour to connect with this road, but the travel was always small. Here, it is true, there was only a suburban traffic to be developed.

Record of New Railroad Construction.

Information of the laying of track on new railroad lines is given in the current number of the *Railroad Gazette* as follows:

Atchison, Topeka & Santa Fe.—The Arkansas River & Western Branch is extended from Sylvia, Kan., west to St. John, 18 miles.

Batesville & Brinkley.—Extended from Auvergne, Ark., north to Newport, 8 miles.

Cape Fear & Yadkin Valley.—Extended from Greensboro, N. C., west to Summerfield, 13 miles.

Chicago, Burlington & Northern.—An addition of 24 miles at different points is reported.

Covington & Macon.—Track laid for thirteen miles from Macon, Ga., an extension of 7 miles.

Orange Belt.—The track is laid to Longwood, Fla., an extension of 6 miles.

Rome, Watertown & Ogdensburg.—Extended from Norwood, N. Y., northeast to Massena Springs, 12 miles.

This is a total of 88 miles on 7 lines, making in all 1,860 miles thus far reported for the current year. The new track reported to the corresponding date for 15 years has been:

	Miles.		Miles		Miles.
1886	1,860	1881	2,615	1876	1 010
1885	1,219	1880	2,424	1875	538
1884	1,584	1879	1,122	1874	833
1883	2,658	1878	900	1873	1,872
1882	5,304	1877	751	1872	3,?37

This statement covers *main track only*, second or other additional tracks and sidings not being counted.

NEW PUBLICATIONS.

The *Baby Pathfinder*, issued by the New England Railway Publishing Company, of Boston, is the very flourishing offspring of the *Pathfinder Railway Guide*, which has been for a long time a standard guide for the New England lines. The *Baby* is intended as a pocket guide, not to replace the parent *Pathfinder*, but rather for those travelers who do not care about the names of officers, shipping directions, freight lines, or any such information, but want a time-table pure and simple. This they get in the *Baby*, whose 100 pages, 4¾ by 3 in. in size, furnish them with a pretty complete guide to all the railroads north of Long Island Sound and east of the Hudson River. Add to this that the *Baby* is well printed and is sold for 5 cents, and it is quite superfluous to say that no traveler in New England can afford to go without it.

TECHNICAL.

Locomotive Building.

The Mason Machine Works in Taunton, Mass., last week turned out a new passenger locomotive for the Boston & Maine Railroad. This engine is the first of an order of 4, and the works are also building 4 switching engines for the same road.

The Tanner & Delaney Engine Co. in Richmond, Va., is rebuilding several Consolidation freight engines for the Chesapeake & Ohio road.

The Brooks Locomotive Works in Dunkirk, N. Y., have taken a contract for 20 locomotives for the Chicago, Kansas & Nebraska road, the Rock Island's new extension into Kansas.

The Pittsburgh Locomotive Works are building several ten-wheel freight engines, with 18 by 24-in. cylinders, for the Memphis, Birmingham & Atlantic road.

The Baldwin Locomotive Works in Philadelphia have recently delivered three engines to the Covington & Macon road.

In the suit brought by Park Brothers against the Grant Locomotive Works in Paterson, the New Jersey Court of Appeals has given its decision. The suit was brought by Park Brothers to compel the trustees of the works to divide certain net profits among the stockholders, the plaintiffs being creditors who held stock under the agreement and assignment in bankruptcy made in 1875. The Court decides that the undivided surplus being in bonds, notes and other obligations not yet due, and which in all probability could not be sold without a sacrifice, the trustees were right in retaining them in possession of the company and in not attempting to use them or divide them, and therefore the complainants were not entitled to any greater dividend than that which they had already received,

The Car Shops.

The Chicago, Rock Island & Pacific Co. has recently awarded contracts for 500 box, 300 stock and 300 flat cars. Of these cars 500 will be built by the Peninsular Car Works in Detroit, Mich., and 500 by the Wells & French Co. in Chicago.

The Ft. Worth & Denver shops in Ft. Worth, Tex., are building 2 new passenger cars for the road, besides doing a large amount of repair work.

The St. Louis Car Roofing Co. recently filled a large order for roofing for freight cars, which the Missouri Car & Foundry Co. is building.

The Pullman Car Works at Pullman, Ill., have recently completed 25 box, 25 coal and 10 flat cars for the Covington & Macon road.

Car Couplers.

The Chicago, Burlington & Quincy Co. has ordered the equipment of 50 freight cars on its road with the Ames coupler, for an extended trial in active service. The Grand Rapids & Indiana Co. has also ordered 6 cars equipped with the Ames coupler for trial.

Bridge Notes.

The Edge Moor Iron Co., at Wilmington, Del., and Mr. Fred W. Smith, engineer, are completing the High Bridge on the Norfolk & Western road near Farmville, Va. The same parties are also finishing up the last of eight double-track bridges on the Philadelphia extension of the Baltimore & Ohio Railroad, and putting a metal roof 600 ft. long on the side walls of a tunnel under Twenty-fifth street, Philadelphia, for the same company. This roof is composed of heavy iron cross girders or rafters covered by steel buckled plates, galvanized, and upon these plates there is to be a water-proofing mastic, then ballast covered by heavy granite paving blocks.

The Boston Bridge Co. is building several bridges for the Fitchburg Railroad, to replace old structures.

Iron and Steel.

The Bellefonte Iron Works at Bellefonte, Pa., have closed a contract with Mr. J. T. Witherow, of Pittsburgh, to build a blast furnace with a capacity of about 100 tons of pig iron a day. The furnace will use coke as fuel.

Vigo Furnace in Terre Haute, Ind., will shortly go out of blast for repairs.

The Linden Steel Co. in Pittsburgh has lately increased its plant by the erection of 2 new helve hammers, with the necessary furnaces, and a new plate and blooming mill.

The Edgar Thomson Steel Works at Braddock, Pa., are putting up a new boiler house with a battery of 40 boilers

This addition is made necessary by the building of 2 new blast furnaces. The works are also adding 5 blowing engines. Each of these engines has 40-in. cylinders, 84-in. blowing cylinder and 60-in. stroke.

The old Allen Furnace at Sharpsville, Pa., which has been idle for several years, has been bought by a party of Pittsburgh capitalists, headed by Mr. Ralph Bagaley. It will be repaired and put into blast.

The old Sophia Furnace at New Castle, Pa., is to be torn down and the materials used in the erection of a new furnace.

The Puget Sound Iron Co. is about to put its furnace at Irondale, Wash. T., in blast. The local ore which is used in this furnace is said to produce iron peculiarly suitable for the manufacture of steel, and the company purposes putting up a steel plant in connection with the works.

The York Iron Co., of Minneapolis, Minn., has completed the erection of a charcoal blast furnace at Black River Falls, Wis., and will put it in blast during the present month. The furnace is 55 ft. high and 11 ft. bosh, and will be run on local ores. It has been named Minneapolis Furnace. Mr. Horace D. Burt is Manager.

The New York Supreme Court has ordered the sale of the property of the Parrott Iron Co., for the benefit of its creditors. This property includes the blast furnace at Greenwood, N. Y., with the adjoining buildings and about 8,000 acres of land in Orange and Rockland counties, on which are five iron mines. The furnace was built in 1812.

Manufacturing and Business.

The New York, Lake Erie & Western Co. has just completed a new planing mill and car shop at Buffalo, the power for which will be furnished by a 125 H. P. Westinghouse engine.

The Wainwright Manufacturing Co., 65 Oliver street, Boston, and 93 Liberty steet, New York, manufacturers of feed-water heaters, filters, expansion joints, radiators and corrugated tubing, has been forced, by numerous orders, to enlarge its plant, and is erecting an addition to the factory of four stories, 31 by 78 ft., which will contain machine shop, corrugating department and radiator department. Their former building has been moved, and will also be utilized as a machine shop. By this change the company will be enabled to increase its product three or four times and meet the demands of the rapidly growing business.

The Knowles Steam Pump Co. has let contracts for the building of an extensive shop at Warren, Mass. The shop will be 225 by 50 ft., two stories high, and will be built of brick.

The Westinghouse Machine Co. in Pittsburgh has recently taken orders for a large number of engines for electric light plants. These orders are for Mobile, Ala.; Wichita, Kan.; Ashland, Wis.; Pittsburgh, Pa.; Schenectady, N. Y.; Buffalo, N. Y.; Plainfield, N. J.; New Bedford, Mass.; Philadelphia and other cities.

The Jeansville Iron Works, near Weatherly, Pa., are finishing an extensive hoisting plant for the iron mines at Almeria, Spain. The machinery is modelled after that used at the Buck Mountain coal planes in Pennsylvania.

The Clinton Metallic Paint Co. has recently completed its works at Clinton, N. Y., and will shortly commence the manufacture of paint on a large scale. The power for these works will be furnished by a 100 H. P. Westinghouse engine.

The Rail Market.

Steel Rails.—The market is quiet, but steady, with quotations continuing at $34@$35 per ton at eastern mills, the lower quotation, as heretofore, being for large orders for late delivery. The mills are all pretty full, and are not at present anxious for orders. It is reported that negotiations are in progress for several lots of English steel rails, to be delivered at Texas ports, where foreign rails can be put down for about the same price as those from American mills, owing to the very low rates now offered for ocean freights.

Rail Fastenings.—A fair demand is reported and quotations are unchanged at 2.40 cents per lb. for spikes in Pittsburgh; 2.75@3.10 for track-bolts, and 1.65@1.80 for splice-bars.

Old Rails.—An exceedingly dull market is reported for old iron rails, and quotations are entirely nominal at $18@$19 per ton at tidewater. Some sales of old American iron rails are reported at $21 per ton in Pittsburgh. Old steel rails are also dull, and are quoted at $20@$22 per ton in Pittsburgh.

The Baldwin Locomotive Works.

The Baldwin Locomotive Works in this city have just completed and shipped an engine numbered 8,000. The first locomotive built at these works was turned out in December, 1832, and it took 20 years, until November, 1852, to build 500 engines. The second 500 engines were built in eight years, number 1,000 being finished February, 1860. The next six years saw the third 500 built, number 1,500 leaving the shop July, 1866. The fourth 500 were built in three years, by Oct. 30, 1869; the fifth 500 in two years; and the sixth and seventh 500 each in one year, engine number 3,500 leaving Nov. 20, 1873. Business then slackened, three years being required to build the next 500, and two years the following 500, engine number 4,500 leaving Dec. 17, 1878. Then trade improved, 500 engines being built in fifteen months and 1,000 more engines in 22 months, while 500 more engines were finished in 10 months, number 6,500 leaving Dec. 6, 1882, and marking a half-century for the works. The next eight months saw 500 more built, and before the close of 1884 number 7,500 was turned out. Work has again slackened, and 19 months were required for the final 500 locomotives, number 8,000 having just left the establishment. It is noteworthy that one-half the whole number, and these by far the heaviest and most elaborate engines that have been built, were turned out within the last ten years, the first 4,000 requiring 44 years to build.—*Philadelphia Ledger.*

Western Society of Engineers.

The last regular meeting of this society was held in Chicago, July 6, President Wright in the chair. A number of applications for membership were received. The following persons were elected members: Sigwald Udstad, Chicago; Alva M. Van Auken, Fremont, Neb.; Geo. T. Wickes, Bozeman, Montana.

A letter of thanks from the American Society of Mechanical Engineers, for courtesies received at the recent meeting of that society, was read and placed on file.

A paper on Gravel Roadways with Telford Foundations, by C. C. Matlack, was read and discussed, and the Society then adjourned.

Electric Motors for Street Railroads.

A company has been organized at Lawrence, Mass., to manufacture electric engines to propel street cars, under the patents secured by Mr. C. A. Jackson, of Haverhill, Mass. The capital stock is fixed at $1,000,000 and the company purposes building shops of its own.

The Cable Plan of Towing Canal Boats.

A steam-tug has been for some time engaged in taking up the old cable at the bottom of the Erie Canal from Gere's Lock, near Syracuse, N. Y., to Buffalo. This was laid nearly 10 years ago, and was intended to supplant horses as power for moving canal boats. An English company, engaged in the enterprise, built over 30 boats to be thus propelled. The scheme having proved a disappointment, no cable boats have been used since 1883. They are now mostly collected in Lockport. The cable plan was known as the Belgian system, and has been in use in Belgium and Holland for a number of years.

Aluminium.

The American Aluminium Co., of Detroit, bas been incorporated. It is organized to mine, smelt and manufacture aluminium or any of its alloys in any state or territory of the United States, or in any foreign country. The corporation has a paid in capital stock of $2,500,000, the machinery being valued at $3,000, and the patents at $2,497,000. The stock is divided into 200,000 shares of $25 each, held as follows: John W. Smith, Pontiac, Mich., and Frederick J. Seymour, Findlay, O., each 47,500 shares; Wm. L. Webber and Sanford Keeler, East Saginaw, Mich.; Harry A. Conant, Monroe, Mich.; C. Stuart Draper, Pontiac, Mich., each 1,000 shares. These seven gentlemen named constitute the first board of directors.

The Borsig Locomotive Works.

The Borsig Locomotive Works at Berlin, which are the oldest on the continent, having been in existence 48 years, are shortly to be closed, owing to the fact that through the low prices prevailing of late, the establishment has for some time been carried on at a constant loss. These works are said to have turned out more locomotives than any other similar establishment in Europe, and in point of output to be surpassed only by the Baldwin locomotive works in Philadelphia, which, as noticed in another column, have just completed their 8,000th engine.

Logs from New Brunswick by Sea.

The most remarkable raft of logs ever put together will leave St. Johns, N. B., for New York in a few days. It is a cigar-shaped cylinder 400 ft. long, with the beam and draught of a sea going vessel, and contains 3,500,000 ft. of logs. Its value at St. Johns is $35,000. It will be hauled by a regular ocean steamer which will follow the coast pretty closely. The success of the enterprise will depend on the weather. A storm would doubtless cause total loss. The object is to save $8,000 duties, sawed timber being taxed, while logs are not.

Engineers' Club of Philadelphia.

A business meeting of the Club was held at its house in Philadelphia, June 19, President Washington Jones in the chair, 21 members and 1 visitor present. The tellers of election reported the following elected members of the Club: Active, J. S. Walker, Hiram J. Slifer, Richard B. Osborne, G. L. Jones, Geo. Henderson and B. H. Wright. Associate, E. V. Douglass.

The Secretary presented a report from the Publication Committee, to which was referred the question of providing additional facilities for the discussion of papers. The committee recommended that the present methods should be continued, and the report and recommendations were adopted.

The Secretary presented, for Prof. L. M. Haupt, resolutions requesting Congress to appropriate $1,000,000 for improving the entrance to New York harbor, and further requesting that this amount be not appropriated for any special plan, but that the plan for the improvement be left to the Chief of Engineers and all competitors be allowed to present their plans. These resolutions were adopted.

The Secretary presented for the "Reference Book" of the club a table of the size of chimneys, by Mr. H. K. Lee, and a table of approximate metric equivalents, by Mr. F. Brooks, of Boston.

The Secretary presented a letter stating that the Superintendent of the United States Coast Survey has given his consent to the presentation to the club for publication and discussion of the investigation made by Capt. McCorkle of the movement of ice in the Delaware River in 1886.

Mr. Gratz Mordecai then presented an elaborate paper, accompanied by maps, and entitled "Notes on the Investigation of the Movement of Freight and Passengers in Large Cities," having special relations to New York City and its surroundings.

The Club then adjourned for the summer, to meet at the call of the chair.

Signals at Highway Crossings.

In their report on a recent accident at Wakefield, in which four persons were killed at a highway crossing, an express train on the Boston & Maine road striking the carriage in which they were driving across the tracks, the Massachusetts Railroad Commissioners express their views as follows:

"The crossing is guarded by a gate, but the gateman left his post at 8 p. m. on this occasion, as he always did. Besides the Portland express, there are nine regular trains passing this point between 8 and 12 p. m., one of which (due at 10:04) does not stop at the station near the crossing. The bell was rung properly. It had been the practice to whistle when approaching Albion street until after the passage of chap. 334 of the acts of 1885, when, upon the petition of the selectmen and other citizens of Wakefield, whistling at this crossing was forbidden by the road.

"The views of the Commissioners in regard to that act are set forth in the annual report for 1885, pp. 26-28. * * *

"It is an illustration of these views that at this very crossing two accidents—one of them fatal—occurred while the practice of whistling was in full force; and that on two occasions travellers have driven through the closed gates. No one precaution will always shield travelers from the consequences of their own negligence, and no one can have imagined that the discontinuance of a precaution would operate as a safeguard where both parties were negligent. In this case the testimony shows negligence on the part of the driver, who was warned not to venture on the crossing. It also appears that it was the practice of the railroad managers to withdraw the gatemen at 8 p. m., although several regular trains, one of them a full express, run over the road between 8 and 12 p. m. This is an unsafe practice, tending to endanger travellers, especially those who know the existence of a gate at the crossing. To such persons the fact that the gate is not closed is an assurance that no train is due. The upright bar of the gate is a safety signal, and if it is a false signal, it is a source of danger.

"A night man, in addition to the station agent, was employed at the station, who might have tended the gate, and who does now tend it, but at this time it was not regarded as a part of his duty. The Board has heretofore expressed its views as to the danger resulting from the withdrawal of gatemen or flagmen during the time when trains are running over railroads. The Boston & Albany Railroad Co., which never sounds a whistle as a crossing signal at any point within the city limits, guards its important crossings for the whole 24 hours, and withdraws its flagmen and gatemen from none until midnight. The Boston & Providence also guards its suburban crossings at each end of the road during the whole period of 24 hours. This safe and prudent practice is strongly recommended to all railroad managers."

Freight and Passenger Movement in New York City.

At the last meeting of the Engineers' Club of Philadelphia, Mr. Gratz Mordecai (author of "Terminal Facilities of the Port of New York") presented notes on the investigation of the movement of freight and passengers in cities, and exhibited a large map—about 6 by 10 ft.—showing New York city and surroundings from 86th street on the north to the Erie Basin on the south. His remarks are thus reported in the proceedings of the Club:

He said: "There is a great amount of information about every city scattered in its different public offices and in those of various corporations and firms, and my desire was first to combine and make all this information intelligible. I knew that every department of the city government was thoroughly acquainted with its specialty, and that the insurance companies, the directory men and many others had done what we would call—out in the country—an enormous amount of 'field work,' and that their field books were to a very large extent available. My first step was to get a 400-ft. scale map of the city, and I fortunately found one almost exactly to that scale, showing, however, only the streets. I converted to the same scale the different maps I found, in surrounding cities, in the offices of the railroad companies, of the U. S. Engineers, the Dock Department and other sources, and in that way I compiled a fairly accurate map to that well approved scale for preliminary work, showing, in some detail, yet in a comprehensive way, the streets, street railroads, docks, railroad yards, tracks and facilities, freight houses, city markets, etc.

"My next desire was to show something about the freight centres and the location, growth and concentration of the various trades. I placed on the original map the house number at the corner of every street (which was given in the directory); and from the business directory, taking the different trades and manufactures separately, I made lists of the numbers at which they were located on every street and by this means located them on my map, which shows, in different colors, the location of the retail dealers in food and manufactures, of the wholesale dealers in food and manufactures, and fixes the location of some of the various trades and freight centres, by special marks and numbers.

"Appreciating that a city is both a centre of consumption and a centre of distribution, and knowing that an investigation of the movement of freight depends, for one thing, upon a knowledge of the local consumption, which must depend in part upon its population, I made my estimates of population (permanent and floating) in every ward of the city, and from them made an approximate estimate of the average daily movement of freight for local supply, and incidentally (from the reports of the different city railway companies) of passengers, and some of the approximate figures are given as follows:

"Average daily passenger movement, 1884, elevated, 265,000; surface, 505,000; total, 770,000, or fully one-half the permanent population.

"Average daily tonnage of freight (fuel, clothing, coal, etc.) delivered directly to consumers south of 86th street: 1885, 13,300 tons; 1895, 17,200 tons.

"To be sure this movement varies in amount with the seasons, and these figures are only intended to give some idea of the average daily movement of freight for local supply to one destination.

"I did all this work simply from my own personal desire to see what could be done, and doing it, as I did, without authority, my results, to be sure, are incomplete, and my maps hardly more than begun, but I determined to my satisfaction

"1. That it possible to collect and combine in this way information of great value for the growth and prosperity of a city, and for the enlargement of its conveniences for works such as docks, railroads, markets, freight houses and other works.

"2. That an engineer, by patient investigation and the aid of such a map, combined with such detailed maps as the insurance maps, could make a most valuable report upon the methods and cost of handling, distributing, storing and selling the necessaries of life and the principal articles of trade.

"3. That the practical uses of such a report would be in the regulation of cities and corporate laws and in determining the location of public works and improvements."

Here followed some general remarks upon the responsibility of the engineer in regard to location and the different influence he exerts in country and city work, as instanced in the cases of the West Shore Railroad through central New York and the elevated railroads in New York city.

"I cannot help closing with the plea that you do something to prevent the public convenience from being handed over, in an economic and engineering regard, to pecuniarily interested parties, and also to establish the rule that public franchises of all kinds for industrial purposes should be reported on, not only by a corporation attorney, but also by a corporation engineer; for no matter how bright, far-seeing and progressive the promoters of new enterprises may be, it would seem that in public matters they should be officially controlled and aided by your experience and deliberate methods of study."

An Electric Train Signal.

The Fitchburg Railroad Co. is now testing on its passenger trains an electric signal, which is thus described by the Boston *Herald*: "The common bell cord is retained in the cars, but instead of passing from one car to another it is connected at each end with a wire which runs down through the floor and by a tight-fitting cap into the interior of the rubber hose of the automatic air brake. By an ingenious arrangement of buttons, the act of uniting the couplings of the air brake establishes the electric connection. The electric current is produced by six Le Chance batteries, which are hermetically sealed and placed in a suitable box in the cab of the engine. Of course an open circuit is used, and by pulling the bell rope in any part of the car the circuit is closed and a gong in the engine cab is rung, and the same effect is produced by the breaking apart of the train. The device is the joint invention of Messrs. George D. Burton, of New Ipswich, N. H., and Charles H. Magoon, of St. Johnsbury, Vt. For the purpose of equipping railroad trains with the device, a corporation called the Automatic Electrical Signal Co. has been organized under the laws of the state of Maine, with a capital stock of $100,000. Mr. Magoon is President and Mr. Burton Secretary and Treasurer, and the directors are John H. Fox, of East Jaffrey, N. H., and Luther F. Lewis, Murray V. Livingstone and J. T. Wilson, of Boston."

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Cincinnati, Indianapolis, St. Louis & Chicago, special meeting, at the office in Indianapolis, July 26, at noon, "for the purpose of considering the propriety of issuing mortgage bonds for the redemption and payment of the present debt of the company."

Nashville, Chattanooga & St. Louis, annual meeting, in Nashville, Tenn., Sept. 15. Transfer books closed June 16.

St. Paul, Minneapolis & Manitoba, annual meeting, at the office in St. Paul, Minn., Aug. 19. Transfer books close July 21.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Illinois Central, 3½ per cent., semi-annual, payable Sept. 1. The last dividend was 4 per cent.

Pullman's Palace Car Co., 2 per cent., quarterly, payable Aug. 16, to stockholders of record on Aug. 2.

St. Louis & San Francisco, 3½ per cent., semi-annual, on the first preferred stock, payable Aug. 10, to stockholders of record on July 27.

Terre Haute & Indianapolis, 3 per cent., semi-annual, payable Aug. 2, to stockholders of record on July 19.

Railroad and Technical Conventions.

Meeting and conventions of railroad associations and technical societies will be held as follows:

The *Master Car & Locomotive Painters' Association* will hold its annual convention in Chicago, beginning on Wednesday, Sept. 8.

The *Western Society of Engineers* holds regular meetings at its hall, No. 15 Washington street, Chicago, at 7.30 p. m., on the first Tuesday of each month.

Transportation in Congress.

In the House on the 21st:

The Inter-state Commerce Bill was taken up and debated, the question being on the amendment reported by the Committee on Commerce, which was to strike out all after the enacting clause of the Senate bill and insert the House bill. Mr. O'Neill, of Pennsylvania, and Mr. Davis, of Massachusetts, favored the Senate bill, which, they asserted, while it was as strong an anti-discrimination measure as the House bill, was not destructive of railroad enterprise, as was the case with the more ironclad measure recommended by the Committee on Commerce.

Mr. Hitt (Illinois) favored both bills in so far as they contained the meritorious provisions prohibiting unreasonable rates, unjust discrimination, rebate and drawback. The Senate bill, giving the discretion as to the enforcement of the long and short haul clause, was much preferable, as the prohibition of a higher charge for a short than for a long haul might be oppressive on the people west of Chicago. It was not right by an arbitrary law like the Reagan bill to take from the Northwest the advantages given by a natural position. Such a law might raise the rates for the Northwest 15 to 25 per cent. He preferred a commission bill because it had been practically tried in Illinois and many other states as well as in England, France and other countries, while the Reagan bill was an experiment. Voting for the Senate bill would be practical, for if it passed the House it would at once become a law, whereas the House bill could not possibly pass the Senate.

The House adjourned without coming to a vote.

Baltimore & Ohio Employes' Relief Association.

The June sheet of this Association shows payment of benefits to members as follows: Main Stem, Transportation Department, 140; Machinery Department, 188; Road Department, 104; Baltimore & Philadelphia, 9; Trans-Ohio divisions, 136; Pittsburgh Division, 112; physicians' bills, 165; a total of 854 payments, varying in amount from 18 cents, the lowest, to $1,500, the highest.

Joint Car Inspectors' Association.

The necessity of adopting a uniform system for the inspection of cars has long been urged by railway officials, particularly those engaged in that branch of the service, but there were so many difficulties in the way of carrying out the numerous plans which have been proposed that nothing has been done. A number of those interested took the matter in hand, with the result that a meeting was held at Windsor, Ont., July 17, when the Joint Car Inspectors' Association of the United States and Canada was organized with the following members: Chairman, J. R. Petrie; Black Rock, N. Y.; Secretary, Chas. Waughof, East St. Louis, Mo.; Executive Committee, B. Neil, Kansas City, Mo.; Thomas Sells, Suspension Bridge, N. Y.; D. Hughes, St. Louis, Mo. Charter members: D. Hughes, St. Louis, Mo.; A. S. Welser, Fort Gratiot, Mich.; James Atkinson, Detroit; A. Whittaker, Windsor; T. Anderson, Peru, Ind.; H. D. Harris and R. P. Oxley, Indianapolis, Ind.; J. Stokes and James Fitzjohn, Toledo, O.; M. Krump, Chicago, Ill.; John Turner, Detroit; and Robert Potts, St. Thomas, Ontario.

ELECTIONS AND APPOINTMENTS.

Baltimore & Ohio.—Major A. Hunter Jackson, late Roadmaster, has been appointed Superintendent of the Valley Branch, from Harper's Ferry to Lexington, with office in Winchester, Virginia.

Bellaire, Zanesville & Cincinnati.—Receiver I. H. Burgoon announces that the office of all the general officers has been removed from Woodfield to Zanesville, O.; that the office of Superintendent has been abolished, and that J. M. Miller has been appointed Auditor; J. R. Geddes, Chief Engineer; J. B. Rhodes, Trainmaster, and J. W. Gregg, Master Mechanic.

Central Ohio.—At the annual meeting in Columbus, O., July 21, the following directors were chosen: John R. Hall, David Lee, Samuel Spencer. The road is leased to the Baltimore & Ohio.

Chicago, Burlington & Northern—Mr. J. J. Merrill is appointed Car Accountant, with headquarters at St. Paul, to which place all car reports, movements of cars, and reports of car milage should be mailed.

Chicago, St. Paul & Kansas City.—The following circular from Auditor W. L. Dickson is dated Marshalltown, Ia., July 1:

"The line heretofore operated by the Wisconsin, Iowa & Nebraska Co. has been sold to the Chicago, St. Paul & Kansas City Co. Business prior to July 1 will be settled by the W., I. & N. Co., and drafts for balances should be made on J. V. Johnston, Local Treasurer, W., I. & N. Co., Marshalltown, Ia. The reveuue on business for and after July 1 accrues to the C., St. P. & K. C. Co., and drafts for balances should be made on W. M. Johnston, Treasurer, C., St. P. & K. C. Co., Marshalltown, Iowa."

Columbus & Western.—Mr. George H. Wadley has been appointed Roadmaster, with office in Columbus, Georgia.

Denver & Rio Grande.—The directors of this company as reorganized are: George Coppell, Adolph Engler, John J. Hodiger, Wm. S. Jackson, David H. Moffatt, R. B. Minturn, T. H. A. Tromp, J. Lowber Welsh, George T. Wilson. The board elected Wm. S. Jackson, President; George Coppell, Vice-President; Wm. Wagner, Secretary; Joseph W. Gilluly, Treasurer.

Freehold & Keyport.—At the annual meeting in Freehold, N. J., last week, the following directors were chosen: Stacy P. Conover, R. L. Harrison, Joseph D. Hoff, A. T. Hurd, H. E. Laine, Theodore W. Morris, J. E. Ralph, John S. Shultze, Wm. R. Shultze, Daniel P. Van Dorn, W. H. Vredenburgh, H. B. Willits, Samuel I. Wright.

Lake Shore.—At the annual meeting in Laconia, N. H., July 19, the following directors were chosen; B. F. Dake, Lake Village, N. H.; J. F. Cloutman, Alonzo Nutt, Farmington, N. H.; Charles A. Busiel, F. P. Holt, Stetson Hutchins, S. S. Wiggin, Laconia, New Hampshire.

Marquette, Houghton & Ontonagon.—At the annual meeting in Marquette, Mich., last week, the following directors were chosen: S. L. Smith, Lansing, Mich.; Hugh McMillan, James McMillan, Detroit, Mich.; F. L. Higginson, J. P. Lyman, Wm. Simes, A. F. Sise, J. L. Stackpole, Nathaniel Thayer, Boston.

Passaic & New York.—This company (whose road is leased to the New York, Susquehanna & Western Co.) has elected Bird W. Spencer President; J. P. Rafferty, Secretary and Treasurer.

Pennsylvania.—Mr. John A. Ackley has been appointed Freight Agent for New England, to fill the vacancy caused by the resignation of Mr. Samuel Finlay. Mr. Ackley has been the General Freight Agent of the Boston Division of the New York & New England Railroad.

Pennsylvania Company.—Mr. M. A. Zook is appointed Engineer of Maintenance of Way of the Indianapolis & Vincennes Division, with headquarters at Indianapolis.

Pensacola & Memphis.—This company has elected L. H. Sellars President; B. H. Warren, Vice-President; S. N. Van Praag, Secretary; S. C. Cobb, Treasurer; W. B. Wright, Auditor; John C. Avery, Attorney.

Peoria & St. Louis Air Line.—At a meeting held in Petersburg, Ill., July 10, the following officers were chosen: President, T. W. McNeely; Vice-President, E. W. Hays; Secretary, J. G. Strodtman; Treasurer, John A. Brahm; Chief Engineer, H. Hamilton.

Richmond & Danville.—The following order from General Manager E. B. Thomas is dated Richmond, Va., July 15:

"1. Mr. C. A. Darlton is appointed Superintendent of Telegraph, to take effect on this date. He is, under the direction of the General Manager, charged with the supervision of the telegraph service of this company on all its lines, and especially with the connections between the different divisions at junction points. While the linemen and operators employed by this company will remain under the control of superintendents, he will co-operate with them in securing and maintaining an efficient telegraph service.

"2. All requisitions for telegraph supplies and materials will be forwarded to him by the superintendent, and, when certified to by him, he will transmit them to the General Manager for approval."

Rutland.—At the annual meeting in Rutland last week the following directors were chosen: Charles Clement, Percival W. Clement, Rutland, Vt.; Charles Amsden, Amsden, Vt.; John W. Stewart, Middlebury, Vt.; Bradley B. Smalley, Wm. Wells, Burlington, Vt.; George H. Ball, Worcester, Mass.; Silas Pierce, Charles G. White, Boston. Messrs. Amsden, Pierce and White are new directors, succeeding G. M. Barnard, T. J. Coolidge and J. O. Sargeant. The board elected Charles Clement President; Percival W. Clement, Vice-President; J. C. Barrett, Clerk; John A. Mead, Treasurer.

St. Louis, Fort Scott & Wichita.—Mr. J. H. Richards has been chosen Vice-President in place of Mr. J. W. Miller, who has gone to the New York, Providence & Boston road.

Southern Railway & Steamship Association.—At the annual convention, in Washington, July 15, this Association elected the following officers for the ensuing year: Joseph E. Brown, President; Virgil Powers, General Commissioner; Charles A. Sindall, Secretary; Milo S. Freeman, Auditor; John Screven, Thomas H. Carter and E. K. Sibley, Arbitrators. The Executive Committee consists—For the Virginia, Tennessee & Georgia Air Line, Henry Fink; Richmond & Danville, E. B. Thomas; Savannah line, W. G. Raoul; Charleston line, John B. Peck; Louisville & Nashville, E. B. Stahlman; Cincinnati, New Orleans & Texas Pacific, John C. Gault; Western & Atlantic, R. A. Anderson; Atlantic Coast line, Henry Walters; Nashville, Chattanooga & St. Louis line, J. W. Thomas; Coastwise Steamship Association, T. G. Eger.

Texas & Pacific.—Mr. W. W. Finlay has been appointed General Freight Agent, with office at Dallas, Tex. Mr. Finlay was recently Assistant General Freight Agent of the Missouri Pacific.

Union Pacific.—Mr. C. N. Pratt has been appointed General Storekeeper, with office in Omaha, Neb. Mr. J. P. Pringle and Mr. J. H. Stafford are appointed Assistant Storekeepers.

Valley, of Ohio.—Mr. S. L. Campbell is appointed Auditor, with office in Cleveland, Ohio.

PERSONAL.

—Col. L. F. Livingston has resigned his position as President of the Covington & Macon Railroad Co., in consequence, it is reported, of a disagreement as to the route proposed for that line.

—Mr. Samuel Sloan, President of the Delaware, Lackawana & Western Co., sailed from New York for Liverpool in the "Etruria," July 17. Mr. Sloan intends to pass a three months' vacation in Europe.

—Mr. John Hodge, who recently resigned his position as Master Car-Builder of the Missouri Pacific Railroad, has accepted the position of Superintendent of the works of the St. Charles Car Co., at St. Charles, Mo. Mr. Hodge is a carbuilder of wide experience.

—Mr. E. J. Turner, Secretary of the Kansas Railroad Commission and a very active officer, has been nominated for Congress by the Republicans of the Sixth Kansas District. The nomination is considered equivalent to an election, as the district usually gives a large Republican majority.

—Mr. Norman W. Talcott died in Springfield, Mass., July 18, after long illness. He was born in Bolton, Conn., in 1819, and, after engaging in several business enterprises, in 1858 he bought what was then known as the Sizer Forge in Springfield. He subsequently removed it to Brightwood and did a large business in car axles, furnishing them to many New England roads. He served as a bank director, and was also an alderman of Springfield for some time.

—Abraham Firth died at his home in Lynn, Mass., at the age of 68. Mr. Firth was well known as a railroad man and a philanthropist during his long life, and leaves a record unstained as a man and a citizen. He was many years Superintendent of the Boston & Worcester Railroad, and continued in the employ of the Boston & Albany Co. several years after the consoldation. After relinquishing this position he became Superintendent of the Marginal Freight Railroad. Still later, he became interested in improved methods of railway signaling. Mr. Firth's only public office was his service as a member of the Common Council in 1875–76. He was one of the earliest members of the Massachusetts Society for the Prevention of Cruelty to Animals, and continued active in its councils to the time of his fatal illness. He was interested also in many other works of reform, and supplemented his zeal by acts of private generosity, which endeared him to the poor and needy.

TRAFFIC AND EARNINGS.

Railroad Earnings.

Earnings of railroad lines for various periods are reported as follows:

	1886.	1885.	Inc. or Dec.	P. c.
Six months to June 30:				
Ala. Gt. South...	$544,874	$519,610	I. $25,264	4.9
Cin., N. O. & T. P.	1,282,446	1,207,659	I. 75 787	6.3
Cleve., Ak. & Col.	240,971	231,113	I. 9.858	4.3
Col., H.Vy. & Tol.	1.045.789	1,069,748	D. 23,959	2 2
Den. & R. G. W..	466 911	433,524	I. 33,387	7.5
Des. M. & Ft. D.	150,842	169,287	D. 18,445	10.9
Georgia Pacific...	335.141	288.183	I. 46.958	16.3
N. O. & Nor'east.	300,571	345.380	D. 44.809	13 0
South Carolina..	521,013	532,993	D. 11,980	2.3
Vicks. & Mer.....	238,215	198,121	I. 40 094	20 3
Vick., Shre. & P.	196,846	161,612	I. 35,234	21.7
Five months to May 30:				
Den. & R. G. W..	$378,110	$345.444	I. $32,666	9 5
Net earnings...	106 296	46.619	I. 59 677	127.9
Oreg. Short Line.	770,137	603.804	I. 166,333	27.5
Net earnings...	215,633	148,920	I. 66,713	44.6
Southern Pac. Co.:				
Atlantic System	3,416,497	.. ..	.....	....
Net earnings..	781,810	.....	... .	...
Pacific System..	8,750,139	.....	.....	....
Net earnings.	4,291,801	... ..	.....	....
Four months to April 30:				
Central Pacific...	$4,473,525	$4,067,778	I. $405,747	9.9
Net earnings...	2,350,687	1.933,853	I. 416,834	21.6
Month of April:				
Central Pacific....	$1,232,419	$1,052,841	I. $179,578	17.1
Net earnings...	630,851	563,958	I. 66,893	12.0
Month of May:				
Den. & R. G. W..	$92,017	$81,771	I. $10,246	12.5
Net earnings...	32,197	24,817	I. 7.380	29.6
Oreg. Short Line.	187,119	148.321	I. 38,796	26.2
Net earnings...	54,644	46,257	I. 8,387	18.2
So. Pacific Co.:				
Atlantic System.	592,699	.....	.. .. ..	....
Net earnings..	48.714	.....	.....	.. .
Pacific System..	2,146,525	.....	....	....
Net earnings..	1,192,560	.. ..	.....	....
Month of June:				
Ala. Gt. South...	$88,345	$68,011	I. $20,334	29.9
Cin., N. O. & T. P.	229,304	206,386	I. 22 918	11.1
Cleve., Ak. & Col.	46,963	44.048	I. 2.915	6.6
Col., H.Vy. & Tol.	179,208	190,689	D. 11,481	6.0
Den. & R. G. W.	88,800	88,080	I. 720	6.8
Des M. & Ft. D...	22,138	27,329	D. 5 190	19.2
Georgia Pacific...	36,083	28,690	I. 7.393	25.5
N. O. & N. E	40.112	36,900	I. 3,212	8 7
South Carolina.	62.419	50.523	I. 11.896	23.6
Vicks. & Mer.....	32,486	25.269	I. 7.217	28.8
Vick., Shre. & P.	26,452	26,966	D. 514	1.9
Second week in July:				
Buff., R. & Pitts.	$24,363	$24.141	I. $222	0.9
Cairo, V. & C.....	15.442	8.102	I. 7,240	90.6
Canadian Pac....	219.000	206,000	I. 13.000	6.3
Chi. & Alton....	174.036	165.928	I. 8.108	4.9
Chi. & East. Ill..	29,617	25,694	I. 3,923	15.2
Chi., Mil. & St. P.	461,000	416,368	I. 44.632	10.7
Chic. & N. W....	504.100	472.200	I. 31.900	4 8
C., St. P., M. & O.	108,800	107,800	I. 1.000	0.9
Cin., I., St. L. & C.	44,199	40,000	I. 4,199	10.5
Ill. Central	207,700	191,797	I. 15,903	8.3
Iowa lines..... ..	32,800	32,112	I. 688	2.1
Long Island.... ..	87,575	83,656	I. 3,919	4.7
Louisv. & Nash...	271,495	230,520	I. 40,975	17.8
Mil. & Northern..	10,480	11,890	D. 1,410	11.8
Norfolk & West..	59,883	45 094	I. 14,789	32.8
St. L. & S. F....	91 100	64.500	I. 26,600	41.4
Wab., St. L. & P.	228,187	191,263	I. 36,923	19.3

Weekly earnings are usually estimated in part, and are subject to correction by later statements. The same remark applies to early statements of monthly earnings.

Central Traffic Association.

The percentages governing the Chicago pool are as follows, the old and new awards being given:

	Dead freight.		Live stock and dressed beef.	
Roads.	Old.	New.	Old.	New.
Chi. & Grand Trunk...	14.37	14 81	22.48	23.20
Mich. Central.....	2 .10	22.73	18.90	21.40
Lake Shore.....	17.68	17.50	25.11	22.00
Fort Wayne..... ..	20.44	20.73	12.40	14 40
Pan-Handle.....	9.50	10 23	7.12	6 00
Balt. & Ohio	7.29	8.00	5.15	5 00
Nickel Plate.....	8.62	8.90	9.65	8.00
Totals..... .....100.00		100 00	100.00	100.00

On Wednesday of this week a meeting of the Chicago, Peoria & St. Louis committees was to be held in Chicago to consider the subject of putting outlying points from Chicago, St. Louis & Peoria into the pools.

Chicago, St. Louis & Missouri River Association.

The lines in the Chicago, St. Louis & Missouri River Association met in Chicago, July 16, and decided to dissolve the old association. They also voted to restore rates to all points in the territory covered and to join in the new western association, for which preliminary arrangements were made at the meeting held in Chicago during the same week. The provisional agreement to restore rates is to continue until Sept. 15.

A meeting of general passenger agents of the lines interested was held July 19, at which it was resolved to carry the temporary agreement into effect and to restore the rates of fare from Chicago to St. Paul and to all Missouri River points, with corresponding advances to all points beyond, and Commissioner Wilson was directed to inform all connecting lines. It was also decided to carry the action of the managers, in relation to commissions, and to pay no more than $1 commission on one ticket, no outside commissions of any kind to be paid.

Coal.

Coal tonnages for the week ending July 10 are reported as follows:

	1886.	1885.	Inc. or Dec.	P.c.
Anthracite.....	523,117	710,792	D. 187,675	26.4
Eastern bituminous....	249,833	228,314	I. 21,519	9.4
Coke.....	62,137	50,865	I. 11,272	22.1

The bituminous coal market is quiet and prices are low, as they have been all the year. Some of the districts are showing heavy outputs just now, but the shipments are

largely to fill up contracts on which they fell behind in previous weeks.

The coke trade is still very active, although last week's shipments are the smallest reported for some time.

Pennsylvania Railroad coal tonnage for the week ending July 17 was :

	Coal.	Coke.	Total.	1885.
Line of road.....	141,539	75,500	217,039	185,680
From other lines.....	88,837	786	89,623	69,478
Total....	230,376	76,286	306,662	255,158
Year to July 17.....6,147,020	1,783,239	7,930,239	7,174,374	

Increase for the week, 51,504 tons, or 20.2 per cent.; increase for the year, 755,865 tons, or 10.5 per cent.

Cumberland coal shipments for the week ending July 17 were 73,516 tons. Total to July 17 this year, 961,031; last year, 1,429,904; decrease, 468,873 tons, or 32.8 per cent.

Colorado Traffic Association.

The Colorado Railway Association met in Chicago last week and discussed the question of reorganizing the association. No conclusion was reached, however, and the association adjourned without taking any action. The Burlington & Missouri River, however, withdrew the notice which it had previously given of its intention to close connection with the association.

The Western Traffic Association.

The meeting of general managers in Chicago last week came to a close July 16. The managers of the roads finally adopted a temporary agreement, by which rates are to be restored by all the lines west and northwest from Chicago and St. Louis, and all the companies agree to maintain rates, pending negotiations for a permanent settlement of existing difficulties. At the meeting on July 15 two committees were appointed, one to prepare a plan for the settlement of the northwestern troubles and the other of the western complications. These committees were appointed and subsequently made their reports.

The proposition of the Northwestern Committee was as follows :

"*Resolved*, That the rates on freight from Chicago, Milwaukee and points common therewith by the late Northwestern Traffic Association to St. Paul, Minneapolis and Minnesota transfer be restored to the following figures, taking effect July 20 and continuing until Sept. 15, 1886, inclusive : First class, 50 cents; second, 35 cents; third, 20 cents; fourth, 15 cents; fifth, 12½ cents; class A, 17½ cents; B, 15 cents; C, 12½ cents; D, 10 cents. Eastern rates from St. Paul, Minneapolis and Minnesota transfer, first class, 45 cents; second, 35 cents; third, 25 cents; fourth, 20 cents; fifth, 15 cents; class A, 20 cents; B, 17½ cents; C, 15 cents; D, 12½ cents."

The committee recommended that a standing committee be formed, consisting of one representative of each of the initial lines out of St. Paul and Minneapolis, parties to this agreement, who shall at once take up and agree with the Lake Superior lines upon equitable rates from St. Paul, Minneapolis and Minnesota transfer to Lake Superior and Lake Michigan parts. Further recommendations were that the agreement be known as the Northwestern freight and passenger agreement, and that J. N. Faithorn be Commissioner. The roads party to the agreement are to present the Commissioners by Saturday with statements of all contracts or agreements for rates less than those prescribed by the agreement, which are binding upon them after July 20. Such lower rates, if any, if they cannot be conceded, shall become the entire property of the association and open alike to all lines. A further recommendation restored passenger rates after July 20 to the tariff rates in effect prior to May 1 last. The rate of commission after Aug. 1 is to be not more than $1 per ticket, all classes, and E. P. Wilson is to be Commissioner. The report and recommendations of this committee were unanimously adopted.

The Western Committee then submitted a plan recommending that a Western Freight Association be formed, consisting of all members of the former association of that name, to commence July 20, 1886; that the rates shall be such as were in existence in the old Western Freight Association April 1, 1886, the percentages as existing in the old association to be continued in the new one; that the time for giving notice for a wish to rearbitrate range cattle is extended to Aug. 1; that all contracts of all kinds or nature, verbally or otherwise, be reported in writing to the Commissioner, signed by each general manager in person, such contract rates to be the rates reported to and settled by the Association.

It is further provided that a pool be formed on all classes of lumber, posts, telegraph poles, and all products to and through Council Bluffs and Omaha, and to or through Plattsmouth or Blair to all points beyond Plattsmouth and Blair that can be reached in a competitive way through Omaha and Council Bluffs, to commence July 20, 1886, on the basis of 14 cents per 100 pounds, Chicago to Council Bluffs. All the roads accepted the recommendations of the Western Committee, those short in their percentages in the old association doing so with the understanding that they waived none of their claims by doing so, and they were adopted.

It was voted that the parties interested in the Northwestern Traffic Association meet in Chicago, Sept. 8, to hear the committee appointed to prepare a plan for the continuation of the association as now formed, both passenger and freight.

Anthracite Coal Tonnage.

The statement of anthracite coal tonnage for June and the six months to June 30, as furnished by Mr. John H. Jones, the Official Accountant, is as follows, this statement including the entire production of anthracite coal, excepting that consumed by employés and for steam and heating purposes about the mines :

	June		Six months	
	1886.	1885.	1886.	1885.
Phila. & Reading.. ...	1,034,213	935,447	5,096,003	4,727,793
Lehigh Valley	464,212	470,918	2,811,971	2,355,556
Del., Lack. & West... .	368,274	392,572	2,417,665	1,927,877
Del. & Hud. Canal Co...	252,984	255,416	1,669,204	1,310,967
Pennsylvania Railroad..	307,423	282,852	1,609,070	1,550,506
Pennsylvania Coal Co..	115,544	106,787	582,536	568,821
N. Y., L. E. & W..... ..	49,668	46,040	336,927	259,802
Total.....	2,592,318	2,490,032	14,523,376	12,701,322

Increase for the month, 102,286 tons, or 4.1 per cent.; for the half year, 1,822,054 tons, or 14.3 per cent.

The division of tonnage was as follows for the half-year, comparisons being made with last year:

	1886.		1885.	
	Actual.	Allotted.	Actual.	Allotted.
Philadelphia & Reading.....	35 09	37.61	37.20	38.85
Lehigh Valley	19.36	18.96	18.60	19 60
Del., Lack. & Western	16.65	15.54	15.20	16.05
Del & Hudson Canal Co....	11.49	10.66	10.30	11.00
Pennsylvania Railroad Co...	11.08	10.45	12.20	8.00
Pennsylvania Coal Co.	4.01	4 84	4.50	5.00
N. Y., Lake Erie & Western.	2 32	1.94	2.00	1.50
Total..... .....100.00		100.00	100.00	100.00

The stock of coal on hand at tidewater shipping points, June 30, 1886, was 700,736 tons; on May 31, 1886, 614,451 tons; increase, 86,285 tons, or 14.1 per cent., during the month.

For the three months ending with June the shipments have been about 640,000 tons over the allotment as fixed each month.

At a meeting of the Committee in Philadelphia July 20, it was agreed that the output for August should be 2,500,000 tons. If this is not adhered to more strictly than in previous months of this year, there is likely to be a further decline in prices and an increase of stocks on hand.

Coal Tows on the Mississippi.

In a recent issue the New Orleans *Times-Democrat* said of the towboat "W. W. O'Neil": "Of her tow down the 'O'Neil' left 11 boats of coal at Memphis, 3 barges and 1 boat at Natchez, 2 boats on the coast, and brought here 13 boats and 1 barge. Occupying 75 days' time and traveling 9,800 miles, the 'O'Neil' has brought out of the Ohio four tows of coal, the whole aggregating 2,698,200 bushels, or 84,440 tons. On her last trip up the 'O'Neil,' having in tow 3 empty boats from Natchez and 4 from Memphis, made the run from this city to Cairo, 1,050 miles, in 4 days 10 hours and 49 minutes."

Now, compare this with the coal shipments made 30 years ago, when it required 12 steamers and 75 barges to tow 519,000 bushels.

One tow recently leaving Pittsburgh took 10,449,000 bushels, in tons 394,704.—*Pittsburgh American Manufacturer.*

Cotton.

Cotton movement for the week ending July 16 is reported as follows, in bales:

	1886.	1885.	Inc. or Dec.	P. c.
Interior markets :				
Receipts....	5,235	1,477	I. 3,758	254.0
Shipments..... ...	14,669	6,597	I. 8,072	122.3
Stock, July 16..	68,227	23,591	I. 44,636	189.1
Seaports :				
Receipts...	9,471	1,972	I. 7,499	380.6
Exports	36,069	18,604	I. 17,465	93.9
Stock, July 16..... 288,815		239,374	I. 49,441	20.7

The total shipments from plantations for the crop year to July 16 are estimated at 6,451,803 bales, against 5,592,073 last year, 5,643,377 in 1883-84 and 6,928,646 in 1882-83.

San Francisco Grain Exports.

San Francisco exports for the California crop year ending June 30 were as follows, flour in barrels and wheat in bushels, flour being reduced to wheat in the totals :

	1885-86.	1884-85.	Inc. or Dec.	P. c.
Flour.....	1,156,720	418,545	I. 738,175	176.2
Wheat..... 19,262,783		26,855,767	D. 7,592,984	28.3
Total, bushels...24,468 023		28,739,219	— 4,271,196	14 9

Of the flour exported last year, 78 per cent. went to Great Britain, 12 to Australia, 6 to France and 4 per cent. to Belgium. Great Britain also took 90 per cent. of the wheat.

San Francisco Passenger Association.

The San Francisco Passenger Association has just been formed for the purpose of maintaining rates and paying uniform commissions on Eastern business originating at San Francisco. The new commissions to be paid hereafter will be as follows: From California competitive points to Missouri River points, $3 on first-class and $2 on the lower classes ; from Missouri River points to Chicago on all classes, $1; Missouri River points to Mississippi River points between Dubuque and Memphis, 50 cents on all classes; Missouri River points to Mississippi River north of Dubuque and south of Memphis, $1 on all classes; from Chicago to through trunk line points, $2 on all classes; from St. Louis to through trunk line points, $3 on all classes. These commissions will be paid only to recognized authorized company agents, and not to any sidewalk speculators or their agents, and no portion of the same shall be given to the passenger. A fine of $50 will be forfeited for each offense. Mr. Samuel Miller has been chosen Arbitrator, and J. C. Stubbs, Chairman.

Indianapolis Car Movement.

The number of cars received and forwarded at Indianapolis has been :

	Week ending			
	June 19.	June 26.	July 3.	July 10.	July 17.
1886—Total.. 18,672	17,577	17,697	16,179	18,465
Loaded 13 617	12,455	13,532	12,006	13,053
1885—Total.....17,962	17,146	17,696	16,816	17,197
Loaded. ... 13,436	13,161	13,397	12,754	12,916

The increase last week was chiefly in grain bound east, or north to the lake ports. West-bound traffic was lighter than for some weeks past.

Northwestern Freight Rates.

A Chicago dispatch of July 21 says: "The new west-bound rates from Chicago to St. Paul and Minneapolis were promulgated to-day, and are now being charged by all the lines. The general freight agents of the various roads interested in the Southwestern traffic to-day agreed upon the following east-bound rates from St. Paul and Minneapolis and Chicago, which will go into effect at once: First-class, 45 cents; second class, 35 cents; third class, 25 cents; fourth class, 20 cents; fifth class, 15 cents; class A, 20 cents; class B, 17½ cents; class C, 15 cents; class D, 12½ cents. The Minnesota & Northwestern was not represented at the meeting, consequently rates on flour from St. Paul and Minneapolis to Lake Superior points could not be fixed."

RAILROAD LAW.

Mortgage—Claims for Services and Personal Damages.

A dispatch from Knoxville, Tenn., July 16, says : "Judge Jackson in the United States Circuit Court to-day, pronounced an opinion in one of the suits against the East Tennessee, Virginia & Georgia Railroad of much interest to the company and the suitors against it. Under the mortgage of 1881 it has been claimed by the company that the rights of the mortgagees were superior to those of the judgment creditors, for personal damages, as well as those of other creditors, and that no satisfaction of such judgment could be had therefore until after the mortgage had been fully discharged. His honor held that while, at common law, a mortgage would take precedence of all other claims; yet, under the special statutes of Tennessee, which he held to be valid, judgments for services rendered or for personal injuries have priority over the mortgage. He also stated that on such cases, upon proper motion, he would direct sufficiency of purchase money, under the mortgage, to be withheld for the satisfaction of judgments. The claims affected by this decision amount to $200,000 or $300,000, though embraced in a considerable number of suits."

Injury to Passenger—Negligence.

In the case of Harris against the Hannibal & St. Joseph Co., the Missouri Supreme Court holds as follows:

Where the injury is caused by the plaintiff being thrown upon the floor of a caboose car in which he was riding, while passing to the door of such car for the purpose of alighting, before the train had reached the station, and an instruction asked by defendant to the effect that if plaintiff knew, or by the exercise of ordinary care could have known that the train had stopped to do some switching; and by the exercise of ordinary care could have known that a part of the train was likely to be backed against the part to which the caboose was attached, and that some concussion or jar would likely be produced in the caboose; and that the plaintiff then, without thinking about the approach of the cars, and without paying any attention to whether the cars were approaching or not, left his seat and stood up in the car, and was thrown down and injured, when he would not have been had he kept his seat or resumed the same before the cars struck, then the plaintiff is guilty of such contributory negligence as will bar his recovery, is improperly rejected, where there is evidence to support it, as here. Reversed and remanded.

OLD AND NEW ROADS.

Alabama Great Southern.—This company recently filed a bill in equity in the Chancery Court at Chattanooga, Tenn., asking for an injunction to restrain the Nashville, Chattanooga & St. Louis Co., from refusing to receive and haul cars loaded with iron ore and consigned to South Pittsburg and Cowan for the furnaces there, claiming that this section was illegal discrimination. To this bill the defendant filed an answer and a crossbill, in which it is charged that the plaintiff had habitually discriminated against this road, making local rates on ore shipped along its line to points on the Nashville & Chattanooga, and allowing an arbitrary rate which virtually prevented shipments. A long litigation was expected, but on July 15 notice was given that the suits were withdrawn and that the matter had been settled by a compromise. It is now stated that the arrangement was made at the meeting of the Southern Railway & Steamship Association in Washington, when the presidents of the two companies held a conference, and an agreement was reached by which all discriminations will be withdrawn by both companies and there will be hereafter a free interchange of traffic.

Atchison, Topeka & Santa Fe.—The Arkansas River & Western Branch of this road is now completed and open for business to St. John, Kan., 18 miles beyond the late terminus at Sylvia, and 47.7 miles from the junction with the main line near Hutchinson. Tracklaying is steadily progressing westward toward Lewis.

Baltimore & Ohio.—Surveys have been made for a branch from this company's Wheeling & Pittsburgh Division to Monongahela City, Pa., and the right of way is now being obtained. A company known as the Monongahela Railroad Co. has been organized to build this branch. This branch will give the company connection with some valuable coal mines.

The report that this company had finally concluded an agreement for the use of the New Jersey Central tracks was renewed this week, but its truth is denied officially.

The Central Ohio first 6s, which mature this year, $2,500,000 in amount, are to be refunded by an issue of the same amount, bearing 4½ per cent. interest and running until 1930. Holders of the 6s will be given an opportunity to exchange them for the new bonds.

A Chicago dispatch of July 21 says: "Although the courts have lately decided that the contract between the Baltimore & Ohio and the Illinois Central, by which the former secures an entrance into the city and terminal facilities on the lake front, is still in force, yet the Baltimore & Ohio, it is learned, does not propose to insist upon the enforcement of the contract, but means to get into the city by another route as soon as the arrangements can be perfected. Negotiations have been going on for some time past between the Baltimore & Ohio and the Great Western Terminal Co. (Wisconsin Central), by which the Baltimore & Ohio is to get into the city over the latter's route. The negotiations, it is claimed, have virtually been completed, and arrangements are now being made to extend the tracks of the Baltimore & Ohio from South Chicago to the western city limits in order to connect with the Great Western. The Great Western will have its terminus on the east side of the South Branch of the river, at Harrison street and Fifth avenue. There is plenty of available land in that vicinity to provide superior terminal facilities."

Batesville & Brinkley.—This road is now completed to Newport, Ark., on the Iron Mountain road, 56 miles from the starting point at Brinkley, on the Memphis & Little Rock. The road traverses one of the best sections of Arkansas, and for nearly all its length is in a well settled, productive country.

Boston & Lowell.—The directors have decided to issue 2,000 shares of the new stock authorized by the stockholders at the recent special meeting. These shares will not be offered for subscription or allotted to stockholders, but will be sold at public auction in Boston on July 31 next.

Boston & Maine.—It is reported in Boston that this company is trying to secure control of the Providence & Worcester road, in order to give its line from Portland to Worcester an outlet to tidewater at Providence under its own management.

Cape Fear & Yadkin Valley.—Work is progressing steadily on the extension of this road from Greensboro, N. C., westward. Track has been laid from Greensboro to Summerfield, 13 miles, and regular trains will soon be put on the extension.

The branch road to the Randolph cotton factories is to be built at once, and grading has already begun.

Central, of New Jersey.—The New Jersey Court of Appeals has reversed the decision of the Chancellor, and set aside his order authorizing Receiver Little, of the Central Railroad, to sell the Reading bonds pledged as collateral to secure the payment of the Central's floating debt. Some of the bonds were sold under this order. The opinion of the Court has not yet been published, so that its full effect cannot be stated.

Charlotte, Columbia & Augusta.—This company is now changing the gauge of the leased Chester & Lenoir road from 3 ft. to standard. The section from Newton to Lenoir, N. C., was to be completed this week, and work will then be begun on the line from Newton southward to Chester, S. C.

Chesapeake & Ohio.—Work is being pushed on the new station in Louisville, and it is expected that it will be finished in about two months. The train shed will be 325 ft. long, and will have 8 tracks and the necessary platforms.

Chicago & Atlantic.—The latest report current in relation to this road is that the new management is negotiating for a lease of the road to the New York, Lake Erie & Western Co., that company to guarantee 4 per cent. on the first mortgage bonds for one or two years and 5 per cent. thereafter. Nothing definite has been made public in regard to this report, but it seems to be admitted that some negotiations are in progress for an arrangement between the two companies.

Chicago, Burlington & Kansas City.—Articles of incorporation have been filed in Missouri for the Kansas City & Burlington Co., which is to build the extension of this road from the present terminus at Bogard, Mo., to Kansas City, a distance of 68 miles.

Chicago, Burlington & Northern.—This company reports track laid for the week ending July 17, and the total up to that date, as follows:

	Week.		Total.	
Main Line	24 miles	2,318 ft.	325 miles	3,521 ft.
Permanent sidings	3 "	1,055 "	21 "	2,447 "
Temporary sidings	....	.....	18 "	3,219 "
Total	27 miles	3,373 ft.	365 miles	3,907 ft.

The main line track remaining to be laid on July 17 included 21 miles 4,641 ft., between East Dubuque and the Wisconsin River, and 7 miles 4,018 ft. between Oregon and Savanna; a total of 29 miles 3,379 ft., or a little over a week's work.

Covington & Macon.—Tracklaying on this road has been somewhat delayed by high water, but the work has been fully resumed and the rails are now reported down for 13 miles from Macon. The company has three engines and a number of construction cars on the line.

Denver & Rio Grande.—In Denver, Col., July 13, the United States Circuit Court confirmed and approved the sale of this road under foreclosure, and directed the execution of the necessary deeds to the purchasing committee. On the following day the purchasing bondholders took possession, and a new company was at once organized under the name of the Denver & Rio Grande Railroad Co. The new company will issue its bonds and stock as provided for in the agreement of reorganization.

It is reported that in order to complete its system and to utilize certain branches on which construction was suspended by the bankruptcy of the old company, the new company will build a number of short extensions, among which are included the following: From Montrose, Col., to Ouray; from Wagon Wheel Gap to Cunningham Pass; from Meeker, Col., to the Utah line; from Dillon, Col., also to the Utah line; from Lake Fork to Antelope Park; from a point in Gunnison County through the Dalles of the Uncompahgre into the San Miguel Valley, and through that valley to the northern boundary of the state; a cut-off line through South Park Pass to a point on the Durango Branch, and finally an extension from Espanola to Santa Fe, N. M. It is not probable that construction will be begun on these lines immediately. Some of them will most probably be postponed for a considerable time.

Erie & Wyoming Valley.—This company has now obtained all the right of way for the extension from Dunmore, Pa., into Scranton, and work has been begun on the extension, which will be 2 miles long.

Fitchburg.—This company has closed contracts for the building of three new repair shops at Fitchburg, Mass. The shops will be 70 by 40, 50 by 17, and 35 by 35 feet.

Fort Worth & New Orleans.—Tracklaying on this road from Fort Worth, Tex., southeast to Waxahachee on the Houston & Texas Central, a distance of 40½ miles, was recently completed. The company has now concluded a temporary arrangement under which the Houston & Texas Central will operate the road for two years, and through trains will be run between Fort Worth & Houston. The new arrangement took effect July 15, when the first passenger train was run over the road.

Green Bay, Winona & St. Paul.—This road has been for some time in possession of the Farmers' Loan & Trust Co., of New York, as trustee under the mortgages. The Trustee now gives notice that the financial condition of the road has been so much improved that if the first-mortgage bondholders will fund their three unpaid coupons, amounting to $142,000, in 30-year 5s, the August coupon can be paid in cash and the road turned over to the company.

Gulf, Colorado & Santa Fe.—On the extension of this road from Fort Worth, Tex., northward into the Indian Territory, the bridge over the Trinity River is nearly completed and work is in progress on the bridge over the Red River. Tracklaying is in progress from Fort Worth northward, and will be pushed as fast as possible.

Illinois Central.—This company has had surveys made for a branch line to the Mississippi River opposite Helena, Ark. Two lines have been run, one starting from Yazoo City, Miss., and one from Sardis. It is now stated that the road will be built, but the question as to the adoption of the line will depend upon the terms on which the right of way can be secured.

The statement of gross earnings from operation in June is as follows:

	1886.	1885.	Decrease.	P.c.
Ill. and Southern divs	$760,578	$764,607	$4,229	0.6
Iowa leased lines	136,173	136,786	613	0.4
Total	$896,551	$901,393	$4,842	0.5

The Land Department reports sales of 1,924 acres of land for $11,596, and cash collections amounting to $12,399 for the month.

Indiana, Bloomington & Western.—The Cincinnati, Sandusky & Cleveland and the Columbus, Springfield & Cincinnati companies have begun suit against this company and the Receiver to recover $254,675, claimed to be due those companies as back rental, from April 1, 1882, to date, under the decision of the Ohio Supreme Court on the interpretation of the lease.

Lake Superior & Pacific.—This company has filed articles of incorporation in Minnesota to build a railroad from Duluth to some point on the Pacific Ocean. The articles as filed would seem to indicate a line parallel to the Northern Pacific, but it is not probable that that company will be disturbed by the construction of this competing road very soon.

Louisville & Nashville.—This company has sold recently $500,000 of its adjustment bonds, for the purpose of paying the expenses of change of gauge and meeting other outlays for capital purposes.

Memphis, Birmingham & Atlantic.—The grading on the extension of this road from Holly Springs, Miss., to Tupelo, a distance of 60 miles, is now reported to be well advanced. Tracklaying has begun from Tupelo, the crossing of the Mobile & Ohio road, westward, and will also be begun in a few days from Holly Springs eastward. Surveys are in progress for the line from Tupelo to Birmingham, Ala., a distance of about 100 miles. The line of this road will be generally parallel to that of the Kansas City, Memphis & Birmingham.

Mexican National.—The Bondholders' Committee submits to the boudholders the following plan, and recommends that they join in it and deposit their securities as soon as possible.

"In order to provide means to complete the International Line, including the road to the Lampazos coal fields, and acquire the title to the present and future rolling stock for the benefit of the prior and assenting bondholders, and generally to arrange a sound financial basis:

"1. There are to be issued, not to exceed $12,500,000 (aggregate of principal sums) in prior lien bonds bearing interest at a rate not exceeding 6 per cent. per annum.

"Assenting bondholders shall have preference in subscribing to such of said prior lien bonds as may be negotiated to provide means for construction.

"The prior lien bonds and interest thereon, may be made payable in U. S. gold coin in New York, or in any other money and at any other place as the Committee may determine.

"The right to redeem such prior lien bonds at any time at par and accrued interest may be reserved.

"2. The 24,330 present first mortgage bonds shall be converted into securities, to be issued in two series, which shall be a charge on the property, the proceeds thereof and the earnings therefrom derived, next after the said prior lien bonds, to wit: Series A securities bearing 6 per cent. interest, cumulative, payable when earned; Series B securities bearing interest up to 6 per cent. per annum, non-cumulative, payable out of the net earnings of any one year after all the interest due on Series A securities shall have been paid; and for every $1,000-bond there shall be issued $500 in Series A securities and $500 in Series B securities. The overdue coupons and interest accrued on said 24,330 bonds shall be dealt with as the Committee shall see fit.

"Holders of any of the 5,000 bonds dated July 1, 1882, who shall be entitled to the benefits of the collateral trust created by the Mexican National Construction Co., shall be protected in such rights, but otherwise rank even with the holders of other bonds secured by said trust deed.

"3. Control shall be vested in the holders of prior lien bonds, and of the securities into which present first mortgage bonds shall be converted as above provided, until there shall have been earned and paid on Series B securities 6 per cent. per annum for two consecutive years.

"4. To protect the holders of the securities so to be issued against any dilution of their respective interests, the issues shall be limited to the requirements of this plan, and to that end the Mexican National Railway Co. is to be relieved from any liability to the Mexican government, or others, in reference to any lines other than the lines or parts of lines already constructed, and the part of the International Line between Saltillo and San Miguel, and the road to the coal fields—in all about 1,380 miles (unless it shall be deemed for the best interests of all concerned, that so much of the constructed lines as lies between Manzanillo and Colima, about 28 miles, should also be segregated): to which mileage the mortgage lien or liens of the railway company shall be restricted and confined.

"5. To secure from the Mexican National Construction Co. the pledge by it of the entire available interests, which it now has or might have, in said 1,380 miles, the bonds, stock and government subsidy received or to be received on account thereof, as security for the payment of the prior lien bonds, principal and interest, and to insure the execution of this plan."

Mexican Railroad Notes.—The *Mexican Financier* of July 10 notes the official publication of three modified railroad contracts or concessions, as follows:

The first, that of of the Compañía Carbonífera Mexicana, (Mexican Coal Co.), authorizes the company to construct and operate, for 99 years, counting from August, 1881, a railroad with its corresponding telegraph or telephone line from Puebla to the coal regions, with its terminus at the city of Tlaxiaco in the state of Oaxaca. This company has 21 kilometers built and is authorized to change its line, if necessary, and to utilize the material in the new location.

The second modified concession is that of the Mérida & Calkiní Railroad Co., which is authorized to build and operate for 99 years a railroad from Mérida to Calkiní, with a branch to Celtestun, and a subvention of $6,000 per mile is promised. This company has 34 kilometers of road built and must continue building at the minimum rate of six kilometers yearly.

The third modified concession is that of the Cuernavaca & Toluca Railroad Co. This company is obliged to build road at the rate of 16 kilometers yearly, and must complete the road within six years. All these companies are granted liberal privileges for the introduction of building and operating material.

Midland, of Indiana.—Work has been resumed on the extension of this road from Westfield, Ind., westward to Lebanon, and tracklaying will shortly be begun at Westfield.

Montana, Syracuse & Texas.—This extremely ambitious company proposes building a line from Galveston, Tex., northward to Miles City, Mont., with the exceedingly important town of Syracuse, Kan., now heard of for the first time, as its headquarters and central point. The estimated length of the projected line is 1,500 miles. The capital stock is $20,000,000, of which the sum of $20,000 has been subscribed and $20 paid in in cash. We are informed that the company has already raised a sufficient amount to pay the customary fee for recording its articles of incorporation.

New York, Chicago & St. Louis.—The new answer and cross petition filed by the company in the foreclosure suits, as briefly noted last week, asks that the mortgages on the road be declared null and void, on account of illegality in their execution. The cross petition closes as follows:

"The defendant therefore asks the Court to ascertain the actual *bona fide* indebtedness created and now existing in and growing out of the construction and operation of said line of railway, and to whom due; the amount of bonds sold and now held by *bona fide* purchasers and secured by valid mortgages or liens; the amount hypothecated to secure debts created in the construction or management of said railway; the number and amount at law or in equity now held by said syndicate or the members thereof, or assignees, with notice of equities and infirmities of said bonds; what construction there was, if any, for the same; that said alleged and pretended mortgages to said plaintiff and said Central Trust Co. may be declared void and the property therein described be wholly relieved from any and all claim, lien, or incumbrance on account thereof; that all of said property be ordered sold by the Receiver heretofore appointed by this Court, or in such other mode as the Court shall deem for the best interest of the creditors interested therein, and that the proceeds of such sale be applied pro rata upon such actual indebtedness as the Court shall find to exist as aforesaid."

New York, Danbury & Boston.—This company was organized some three years ago, but has done nothing up to the present time. It is now stated that the company has acquired, or will shortly acquire, the partially graded line of the Richfield & New York road, and will begin construction on a line from Danbury, Conn., to New York, a distance of 54 miles. The plan is to connect at the New York end with the Suburban Rapid Transit line and to run passenger trains into the city over that road and the Second avenue elevated line. In connection with the New York & New England road this would make a line from New York to Boston 234 miles long, or about the same length as the line via Springfield. The New York, Danbury & Boston Co. has executed a mortgage to the American Trust Co., of New York, to secure an issue of $3,000,000 in 6 per cent. bonds, for the purpose of building the road.

President Clark, of the New York & New England Co., is reported from Boston as stating that the company has no connection whatever with the new project.

Ohio & Mississippi.—It is reported that the English stockholders, or a portion of them, are dissatisfied with the present management of the road and that an attempt will be made at the next annual meeting to elect directors who will unite with some of those now in the board in making a complete change in the executive officers of the road.

On June 28 last, upon the complaint of people of several towns on the line of the Springfield Division, the Illinois Railroad Commissioners ordered an inspection of that division and took evidence from a number of shippers and others in towns along the line. The Commissioner who was charged with the inspection reported to the board that the road was in poor condition and that none but mixed trains were run over the line. On the part of the company it was represented that the business of the division would not warrant any better accommodations, and that it had been for years actually run at a loss. On July 17, at a meeting of the Commissioners, the board adopted the following suggestions to the company.

1. That a train exclusively for passengers be placed on this division; at least one train to be run each way daily between Beardstown and Shawneetown, and that mixed trains in addition be so run that passengers so desiring should be able to make the round trip between any two stations on the road the same day.

2. That the company should repair the road-bed and track as rapidly as possible, in order that trains may be run at a fair speed with safety. In this connection the Board reminds the company that the towns and counties on the line at the time of the construction of the road issued a large amount in bonds in aid of its building, and that they are still paying interest on these bonds.

3. The Board also calls the attention of the company to the fact that only one director is now a resident of the state of Illinois, while the present constitution of the state requires that a majority of the directors shall be residents, and suggests that, as soon as practicable, the board shall be reconstituted in accordance with this requirement.

Orange Belt.—The proposed line of this road extends from Monroe, Fla., 4 miles north of Sanford, on the Jacksonville, Tampa & Key West road, southwesterly to Lake Apopka. The track is now laid on the main line from Monroe to Longwood Junction, 12 miles, and also on a branch 2 miles long from Longwood Junction to Longwood, and regular trains will shortly be put on this section. The grading is nearly completed from Longwood Junction to Oakland, 15 miles, and tracklaying will shortly be begun.

Philadelphia & Reading.—Special Master Dallas last week filed a report in the United States Circuit Court in Philadelphia, upon the petition of Edward Parsons, in relation to the payment of interest upon the floating debt. The Master states that the floating debt secured by collaterals on Feb. 18 last was as follows: As to the Railroad Co., $6,928,823, and as to the Coal & Iron Co., $777,213, making in all $7,701,036. The annual interest as to the Railroad Co. thereon is $412,654, and as to the Coal & Iron Co., $46,332, being altogether $459,287. The shares and bonds set apart as pledged for the floating debt amount at par to $4,379,925, and their total income to $402,647.

In Philadelphia, July 21, application was made to Judge Butler, in the United States Circuit Court, by Franklin B. Gowen for an order directing the witnesses who declined to reply to certain questions in the Robinson suit for foreclosure of the general mortgage of the Philadelphia & Reading Railroad Company to answer. The application was argued at some length, and the Court reserved its decision.

Providence & Worcester.—The latest Boston report is that the stock of this company has been in request lately, and that the purchases made have been in the interest of the Boston & Maine Co., which desires to secure control of the road for the purpose of extending its Portland-Worcester line to Providence. The road has a large local business, connecting the cities of Providence and Worcester, and having many manufacturing towns and villages on its line. It has fair terminal facilities for freight, but its passenger accommodations in Providence are limited, like those of all the roads entering that city. The stock is pretty well scattered, and a good deal of buying would have to be done to secure a controlling interest.

Richmond & Danville.—At a meeting held in New York last week the directors decided to offer to holders of debenture bonds an opportunity to change those bonds for new consolidated 5s, bearing interest from April 1 last. The offer is to give each holder of a $1,000 debenture bond with the unpaid coupons attached $1,180 in new consols. It is thought probable that this offer will be generally accepted.

Rome, Watertown & Ogdensburg.—Track is now laid on the branch or extension of this road from Norwood, N. Y., the crossing of the Ogdensburg & Lake Champlain road, northeast to Massena Springs, on the Raquette River, a distance of 12 miles. Train will begin to run to the new terminus about August 1 next.

Sacramento Valley, Lake & Mendocino.—This company has been incorporated to build a railroad from Woodland, Cal., through the Capay Valley into Lake County, and thence to Fort Bragg. A preliminary survey has been made and it is stated that a very easy line has been found.

St. Louis, Kansas City & Colorado.—Testimony is now being taken before a Master in the suit brought by this company to enfore a contract which it claims it held for the right of way of the Wabash, St. Louis & Pacific tracks from a point near Forest Park to the Union Depot in St. Louis. The company claims to hold this contract as successor by purchase to the old St. Louis Central Railroad Co., while on the part of the Wabash it is claimed that no such contract exists, and that the plaintiff company has no right whatever in the premises.

St. Paul, Minneapolis & Manitoba.—Work is progressing steadily on this company's extension from Devil's Lake, Dak., westward. Work is also progressing on the Turtle Mountain line to Bottineau, which, it is expected, will be finished this season. Work will also shortly be begun on the Mouse River branch, which will leave the Turtle Mountain line at Broken Bone, about 40 miles from Devil's Lake, and some work has already been done on a branch to Cando, in the Big Coulee country. It is reported that a branch will be built from some point on the Manitoba line in Dakota, southward to the town of Aberdeen.

Southern Pacific Co.—This company's statement for May is as follows:

	At. System.	Pac. System.	Total.
Earnings	$592,699	$2,146,525	$2,739,224
Expenses	543,985	953,965	1,497,950
Net earnings	$48,714	$1,192,560	$1,241,274
Add rental of leased lines			46,681
Total net income			$1,287,955
Charges			1 194,571
Net profit			$93,384

Charges include all interest, rentals, sinking funds, etc. The mileage worked was: Atlantic System, 1,673; Pacific System, 3,025; total, 4,698 miles.

San Antonio & Aransas Pass.—The subscription of $180,000 in aid of the northwestern extension of this road has been completed and the company will immediately begin work on the line from San Antonio northwest to Kerrville, a distance of 70 miles.

Taylor, Elgin & Bastrop.—This unfinished line, extending from Taylor, Tex., on the Missouri, Kansas & Texas road, has been transferred to the Missouri Pacific Co., the purchaser agreeing to take the road and complete it and operate it. About one-half the grading is now finished.

Texarkana Northern.—The grading on this road is now completed from Texarkana, Ark., northward to White Oak Shoals, a distance of 10 miles, and tracklaying has been begun.

Texas & Pacific.—The Wistar or Philadelphia Committee met July 20 and decided to extend the time for receiving deposits on securities under their plan of reorganization from July 15 to Sept. 20. Vague statements have been made from time to time of the very large amounts of securities which were about to be deposited with this company, but their present action seems to confirm the report that they have not ests, with the exception perhaps of the Eastern Division secured a majority, or anything like it, of any of the interbonds.

Toledo, St. Louis & Kansas City.—The following statement has been published by this company:

The purchasers of the Toledo and St. Louis divisions of the Toledo, Cincinnati & St. Louis Railroad organized three companies: The Toledo, Dupont & Western Co. in Ohio, the Bluffton, Kokomo & Southwestern Co. in Indiana, and the Toledo, Charleston & St. Louis Co. in Illinois, to take title to the sections of the road in those states, respectively. Those companies were consolidated June 12, 1886, under the name of the Toledo, St. Louis & Kansas City Railroad Co., and on June 19 the new company authorized the issue of $4,805,000 in preferred coupon stock for the purpose of exchange with certain first mortgage bondholders of the old company, represented by the so-called Quigley Committee. This preferred stock is a lien after the first mortgage bonds, and is entitled to 4 per cent. interest after July 1, 1887, but is not cumulative. All back coupons representing unearned interest to be surrendered on payment of a subsequently maturing coupon. The company has no power to create any other mortgage on its main line, nor to increase the issue of preferred certificates without the consent of two-thirds of the preferred stock present at a meeting to be called for that purpose.

The issue of $12,250,000 of common stock of the new company was also authorized, to be exchanged share for share for the stock of the constituent companies above mentioned; and $9,000,000 of first mortgage 30 year 6 per cent. gold bonds were also authorized and directed to be issued on June 19, the advertised notice reading: "Said bonds and all of said stock mentioned are to be, and will be, issued for the purchase of all of said property, the broadening of the gauge of all of said road, furnishing the same with motive power and rolling stock, paying debts, discharging underlying liens, for exchange with certain holders of securities in the companies heretofore owning said property, and for other corporate purposes." A feature in the new first-mortgage bonds is the reservation by the company of the right of taking up the entire series on June 1 and Dec. 1 of any year, by giving six months' notice and paying $1,050 for each bond and accrued interest.

No securities of the Toledo, Delphos & Burlington Railroad Co., or the Toledo, Cincinnati & St. Louis Railroad Co., will participate in the new organization, except first mortgage bonds of bondholders who are subscribers to a certain trust deed dated April 9, 1884.

Holders of Trustees' receipts for deposit of first-mortgage bonds T., C. & St. L. Co., shall receive preferred coupon stock to an amount equal to the amount of such first-mortgage bonds deposited by them.

Holders of Trustees' receipts for deposit of first-mortgage bonds T., D. & B. Co., main line, shall receive preferred coupon stock to the amount of such first-mortgage bonds deposited by them, to which amount shall be added a sum equal to 50 per cent. of the amount of such first-mortgage bonds excluding interest.

Four thousand dollars per mile of first mortgage bonds have been reserved for the purchase of new equipment, and provision has also been made for the payment of interest for two years, so as to enable the company to put its entire net earnings for that period into betterments and permanent improvements. The entire work of reconstruction, providing for a first-class railroad in every respect, laid with steel rail of not less than 60 pounds to the lineal yard, and changing the gauge, has all been contracted for, and the work is now actively progressing.

Wiscasset & Quebec.—At a meeting of persons in favor of the building of this projected line, held in Augusta, Me., July 20, a committee was appointed to confer with the directors of the Canadian Pacific and to consider means of raising money for the road. The proposed line is from Wiscasset, Me., northward to a point on the projected International road near Moose River.

ANNUAL REPORTS.

The following is an index to the annual reports of railroad companies which have been reviewed in previous numbers of the current volume of the *Railroad Gazette:*

Camden & Atlantic.

This company owns a line from Camden, N. J., to Atlantic City, 59.8 miles, with a branch to South Atlantic and Long Point, 7.7 miles. It operates the Philadelphia, Marlton & Medford, a branch from Haddonfield to Medford, 11.7 miles, making 79.2 miles worked. It also operates a ferry across the Delaware, between Camden and Philadelphia. The report is for the year ending Dec. 31.

The earnings for the year were as follows:

	1885.	1884.	Inc. or Dec.	P. c.
Passengers	$398,416	$378,516	I. $19,900	5.2
Freight	113,396	135,954	D. 22,558	16.6
Mail, etc	49,535	42,224	I. 7,311	17.4
Total	$561,347	$556,694	I. $4,653	0.8
Expenses	427,204	471,056	D. 43,852	9.3
Net earnings	$134,143	85,638	I. 48,505	56.7
Gross earn. per mile	7,068	7,029	I. 59	0.8
Net " "	1,694	1,081	I. 613	56.7
Per cent. of exps.	76.1	84.6	D. 8.5	....

Expenses include taxes and all the expenses of the ferry.

The income account is as follows:

Net earnings, as above		$134,143
Interest and miscellaneous		13,856
Total		$147,999
Rentals paid	$12,337	
Interest "	93,010	
		$105,347
Balance, surplus for the year		$42,652

The report says: "It may be stated, in explanation of the comparison of earnings for the years 1884 and 1885, that the large decrease in the amount of freight moved was principally due to the loss of business from lines connecting at Atco and Winslow Junction, and that the reduction in the earnings of the ferry (Vine street) was due to a reduction in the rates for carrying teams over the ferry, and to the removal of a portion of the railroad business from Cooper's Point to Federal street, Camden, for the benefit of the general business of the railroad. There is also a change in the method of keeping the accounts of this company and companies controlled and operated by it, by which the earnings and operating expenses of the Philadelphia, Marlton & Medford Railroad Co. and of the Kensington & New Jersey Ferry Co. have been included with the earnings and expenses of the Camden & Atlantic Railroad."

Detroit, Grand Haven & Milwaukee.

This company owns a line from Detroit, Mich., to Grand Haven, 189 miles. It is controlled and worked by the Grand Trunk Co., but under its separate organization. The report is for the year ending Dec. 31.

The earnings for the year were as follows:

	1885.	1884.	Decrease.	P. c
Earnings	$1,154,640	$1,254,391	$99,751	7.9
Expenses	839,780	920,765	80,985	8.8
Net earnings	$314,860	$333,626	$18,766	5.6
Gross earn. per mile	6,109	6,637	528	7.9
Net " "	1,666	1,765	99	5.6
Per cent. of expenses	72.7	73.4	0.7	....

Expenses include taxes and all improvements and renewals.

The income account is as follows:

Net earnings, as above	$314,860
Interest on bonds, less interest credits	314,749
Surplus for the year	$111
Balance, Jan. 1, 1885	1,058
Surplus, Dec. 31, 1885	$1,169

The chief decrease in earnings last year was in freight.

The traffic for the year was as follows:

	1885.	1884.	Inc. or Dec.	P.c.
Passengers carried	553,991	592,922	D. 38,931	6.6
Tons freight carried	637,169	681,372	D. 44,203	6.6
Ton-miles	48,537,000	61,641,000	D. 13,104,000	21.3
Rate per ton-mile	1.33 cts	1.14 cts.	I. 0.19 ct.	16.7

The decrease in passenger business was caused by the general depression in business, and through travel was further diminished by the difficulties from ice in Lake Michigan in the first quarter of the year. The decreased tonnage was wholly in through freight, which east-bound was 57,463 tons less and west-bound 2,928 tons less, arising from obstruction by ice on Lake Michigan the first three months of the year, and consequent interruption to lake navigation. The local freight traffic increased 16,188 tons.

Cincinnati, Washington & Baltimore.

This company, successor to the Marietta & Cincinnati, owns a main line from Cincinnati to Belpre, O., 193 miles, with branches from Blanchester to Hillsboro, 21½; Hamden to Portsmouth, 55½; Belpre to Marietta, 11; a total of 281 miles. The report is for the year ending Dec. 31.

The earnings for the year were as follows:

	1885.	1884.	Inc. or Dec.	P. c.
Freight	$1,019,277	$1,079,861	D. $60,584	5.6
Passengers	461,412	536,198	D. 74,786	13.9
Mail, etc	224,581	238,249	D. 13,668	5.8
Total	$1,705,270	$1,854,308	D. $149,038	8.0
Expenses	1,464,830	1,408,371	I. 56,459	4.0
Net earnings	$240,440	$445,937	D. $205,497	46.1
Gross earn. per mile	6,069	6,599	D. 530	8.0
Net earn. per m.	856	1,587	D. 731	46.1
P. c. of exps.	85.9	75.9	I. 10.0	....

Taxes are included in expenses. The decrease in earnings was due to extremely low rates on an increased traffic.

The income account is as follows:

Net earnings, as above	$240,440
Interest on bonded and floating debt	694,488
Deficit for the year	$454,048

The President's report says: "The increase in operating expenses is explained somewhat in detail in the report of the General Manager and in those of the heads of departments. It will be found that of this increase the sum of $30,408 is directly attributable to the floods of 1883 and 1884.

"There has been expended in new and additional buildings, and in the enlargement of others, the sum of $14,373, which would ordinarily go to the construction account, but which is here included in operating expenses.

"In the reduction of gross revenue the passenger traffic shows a diminution as compared with 1884 of $74,786, this notwithstanding a revenue of $30,496 derived from passengers received from and delivered to the Columbus & Cincinnati Midland Railroad.

"It is remarked that the total tonnage for the year was in excess of that of the previous year to the extent of 178,265 tons, while the revenue was less by the sum of $60,584. Had moderately fair rates obtained during the year, it is not unreasonable to assume that this increased volume of business would have more than covered the deficit in revenue, but, unfortunately, the downward tendency referred to last year was not checked till late in autumn, nor until rates had been torn and attenuated to the last degree."

Pacific Mail Steamship Co.

This company runs steamships between New York and Aspinwall; Panama & San Francisco; San Francisco, Yokohama and Hong Kong; San Francisco, Australia and New Zealand ports. The report is for the year ending April 30:

The earnings for the year were as follows:

	1885-86.	1884-85.	Inc. or Dec.	P. c.
Steamship lines	$4,262,032	$4,571,244	D. $309,212	6.6
Subsidies	152,455	190,283	D. 37,828	19.9
Interest, etc	65,452	64,666	I. 786	1.2
Total	$4,479,939	$4,826,193	D $346,254	7.2
Expenses	3,179,454	3,209,138	D. 29,684	0.9
Net earnings	$1,300,485	$1,617,055	D. $316,570	19.6
Per cent. of exps.	71.0	66.5	I. 4.5	....

The following were the proportionate earnings of the several lines from freight and pasengers in 1885-86:

	Passengers.	Freight.	Total.
Atlantic line	$169,974	$787,835	$957,810
Panama line	359,485	1,244,050	1,603,536
Trans-Pacific line	855,909	678,362	1,534,272
Australian line	103,515	62,898	166,414
Total	$1,488,885	$2,773,147	$4,262,032

The President's report states that the net earnings last year were equivalent to 6½ per cent. on the stock, and continues: "On June 24, 1885, the company had the misfortune to lose one of its finest steamers (the 'City of Tokio'), which caused a considerable reduction in the company's earnings on the China line for the year. This, together with the reduction of $120,000 a year in the amount received on through freight under the guarantee with the overland railroads, is the cause of the decrease of earnings below those of the previous 12 months.

"In February last the company received notice from the overland railroads discontinuing the arrangement which had been made in June, 1885, respecting through freight to the Pacific coast. In consequence of this the company established a weekly service between New York and San Francisco, which is now in full operation. On April 25 the company received notice of the wreck of the steamer 'Honduras' on Lempa shoals, off the coast of Salvador, the ship and cargo proving a total loss. On March 4 the company purchased the steamers 'Newport' and 'Starbuck,' and are now operating them—the former on the line between New York and Aspinwall, and the latter on the Trans-Pacific service between Hong Kong, Yokohama and San Francisco."

Minnesota & Northwestern.

This company owns a line from St. Paul, Minn., to Manly Junction, Ia., 130 miles. The line from St. Paul to Lyle, Minn., which was completed Oct. 2, 1885, is worked by the company; the 21 miles from Lyle to Manly Junction, completed Dec. 7, 1885, are operated by the Central Iowa Co. under lease. The first report covers the nine months from Oct. 1, 1885, to June 30, 1886.

Extensions of the road are in progress, as noted in detail below.

The earnings of the 109 miles worked and the income account are as follows for the nine months:

Freight	$200,493
Passengers	62,933
Mail, etc	23,625
Total ($2,633 per mile)	$287,051
Expenses (67.3 per cent.)	193,245
Net earnings ($861 per mile)	$93,806
Interest on bonds	92,000
Surplus	$1,806

The interest charged is on $2,184,000 first mortgage 5s from Oct. 1, 1885, to Jan. 1, 1886, and on $2,588,000 from Jan. 1 to June 30, 1886, the issue being $20,000 per mile.

The report of the President, Mr. A. B. Stickney, says: "The Chicago, St. Paul & Kansas City Railway Co., owning a line from Waterloo in the state of Iowa to Des Moines, the capital of the state, a distance of 115 miles, having entered into a contract to extend its line northwesterly from Waterloo to a junction with the line now under construction by this company, and also from Des Moines southwesterly to St. Joseph and Kansas City, in the state of Missouri, the directors have entered into a traffic contract with it similar to the contract now existing between this company and the Central Iowa Co., It is estimated that the revenue derived from traffic interchanged with it, taking into consideration the longer haul, will be much larger and the business more profitable than the business with either the Central Iowa or the Illinois Central.

"The company has now under construction a line from a junction with its present line at the town of Hayfield, 81 miles from St. Paul, to Dubuque, Ia., a distance of 172 miles. The work has so far progressed that the directors are assured it will be ready for operation by Oct. 1 next. It will connect St. Paul and Minneapolis with Dubuque, Ia., where a connection is made with the Illinois Central Railroad for Chicago. The latter company has heretofore used the lines of the Chicago, Burlington & Quincy for a portion of the distance, namely, from Forreston to Chicago. This arrangement terminates with the end of this year, and the company has commenced the construction of an independent line from the city of Chicago to a junction with the Illinois Central Railroad, near Freeport, Ill., a distance of 109 miles, which it hopes to have ready for operation by Jan. 1, 1887. When these lines are completed, the company will own a continuous line of railway from St. Paul to Chicago, 430 miles, except a section between Dubuque and Freeport, 68 miles, owned by the Illinois Central, which it intends to use under an arrangement with that company."